...r 1910

MOTOR BOATING

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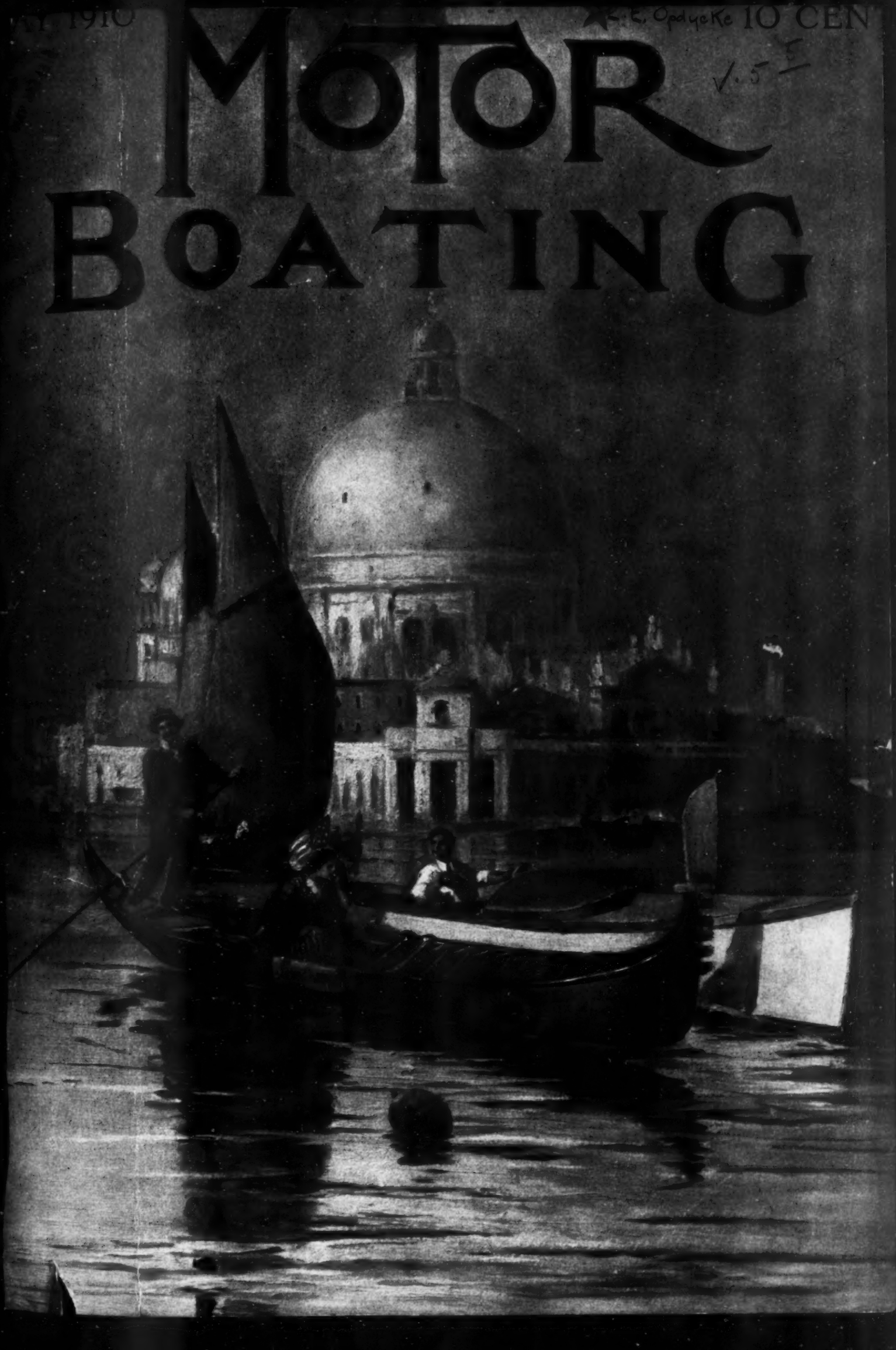

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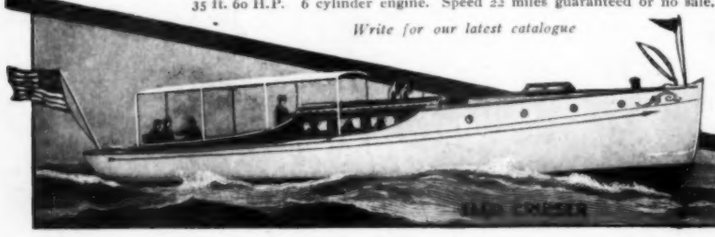

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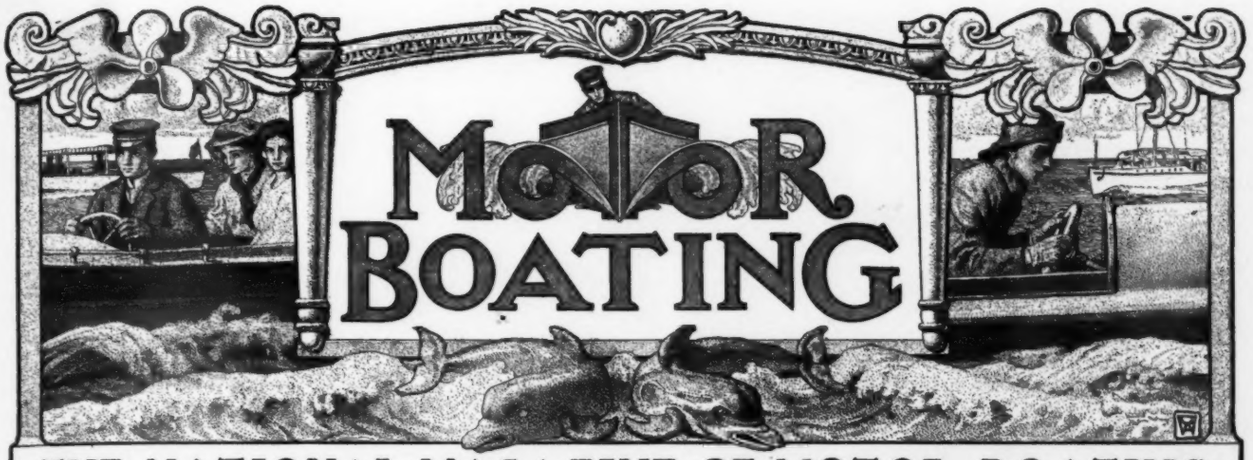
The Booming Surf.



THE NATIONAL MAGAZINE OF MOTOR BOATING

Who Will Defend the Harmsworth?

But Four Months Remain in Which to Prepare for the British International. British Boats Building, but America's Defenders as yet Undetermined.

FOUR months ago the Motor Boat Club of America announced that challenges for the British International, or as it is probably better known in this country, the Harmsworth trophy, had been received from the Motor Yacht Club of Great Britain and the British Motor Boat Club. On the day of this writing, while nothing is definitely known as to what boat or boats will be pitted against the British challengers in an effort to keep the trophy in this country, we can say that in spite of the mist, now gradually lifting, which seems to hang over all things pertaining to the coming race, in spite of the misunderstandings or differences of opinions, which have existed and are not yet entirely cleared away, in spite of the fact that even the scene of the contest is not yet decided upon beyond dispute or question, the situation is more satisfactory than it has been at any time since the challenges were received, to those who have the best interests of this great sport at heart, to those whose pride would be seriously hurt if the prestige, which we as Americans have gained in this branch of sport—through the winning and defending by an American boat of the "blue ribbon" of motor boat racing —were not maintained in a race systematically prepared for, fairly run and won by the best boat competing.

As we have said, the mist is rising and we are beginning to see where we are. Some confusion in the minds of those who have been trying to follow developments was occasioned by a misinterpretation of the action of the Motor Boat Club of America—the flag of which organization Dixie flew when she won the Harmsworth trophy in British waters and defended it at Huntington—in voting at a recent meeting to recommend that the 1910 races be held at Huntington. Too much publicity was given to this action, it is now realized, especially as its meaning was misunderstood to be that the Club had decided definitely to hold the race there. The subsequent action of the Motor Boat Committee of the Automobile Club of America, which, as we shall recall later, is the body in this country recognized by the motor boating bodies of other countries, in voting to hold the race off Larchmont according to the terms of an agreement which was made between the Automobile Club and the Motor Boat Club of America one year ago and is still in force, seemed, because of this misinterpretation, decidedly to complicate matters.

It will be seen that, according to this agreement, the Automobile Club or rather its Motor Boat Committee, have "the powers necessary to the management" of the 1910 race for the British International trophy and the right to direct that the race shall be held off Larchmont. But the trophy must be raced for under the conditions imposed by the deed of gift, and this deed provides that the race shall be held in sheltered waters. Furthermore, the deed provides that the course must be satisfactory to the English challengers. Now Larchmont is not "sheltered," and Huntington surely is, and the Englishmen have placed the seal of their approval on the latter course by racing there. It would seem that some further action must be taken in regard to the scene of the contest. Probably some way will be found of overcoming whatever obstacles may now appear to prevent the holding of the race at Huntington or some other spot equally as good.

It may be interesting to give portions of the agreement referred to here:

> Whereas, The Automobile Club of America is a member of the International Association of Yachting Automobile and the sole representative of the said association in America.
>
> The Motor Boat Club of America is hereby appointed the motor boat section of the Automobile Club of America. It shall keep its name and corporate identity, and shall amend its constitution and by-laws so that the same shall not be at variance with the intent of this agreement.
>
> There shall be appointed by the Board of Governors of each of the parties hereto from among the members of their respective clubs two members, and the four gentlemen so appointed shall constitute the Motor Boat Committee of the Automobile Club of America, of which the President of the Automobile Club shall be ex-officio Chairman.
>
> This committee shall take and exercise all of the powers necessary to the management of any international race under the sanction of the International Association of Yachting Automobile, any races for the British International Cup for motor boats (known commonly as the Harmsworth Cup) that may be run while said cup is in the custody of the Motor Boat Club, and all contests known or advertised as international in character.
>
> In so far as the British International Cup is concerned this agreement shall be subject to the deed of gift and the conditions approved by the British International Cup Commission, and also to all such arrangements as to place and date of the races to be held in 1909 as have already been made. In all other matters concerning races or contests of international character this agreement shall be subject to all the rules and regulations and decisions of the International Association of Yachting Automobile.
>
> It is agreed by the Motor Boat Club of America that the Automobile Club of America, acting for itself and for the Motor Boat Club as its motor boat section, may make an agreement with the Larchmont Yacht Club to the end that all such international races in the vicinity of New York as are herein referred to, excepting the race for the British International Cup of the year 1909, shall be held in waters adjacent to Larchmont Harbor. And in the event of the conclusion of such an agreement the Motor Boat Committee of the Automobile Club shall be increased by the addition of two members to be appointed by the Board of Trustees of the Larchmont Yacht Club from among the members of said club.
>
> This agreement shall remain in force for one year, and thereafter until terminated by one party giving the other party one year's notice in writing of its desire so to do.

And now for the defending boats. Dixie II has been sold since the last race, and her present owner is not a member of the Motor Boat Club of America. Dixie II could change owners every day, but she would still remain America's boat. If we are to have as many defenders as the rules allow everyone who knows anything about motor boating hopes that Dixie II will be one of them. Even if there really are, as is reported, "several fast boats" in process of construction, there is not one of them which will be a more welcome defender in the eyes of the Motor Boat Club of America and all interested in the sport. Of this we are assured.

The time before the running of the race is short—but four months. It is certain that the new boats must be in the water soon. You can't make a cup defender in five minutes and you can't tune one up in a day and a half. Dixie II is some years old and she has not yet reached her limit.

As we write to-day there is nothing definite, nothing known with certainty, but before these lines are read there probably will be, and it will be good news we confidently believe.

Choosing their favorites. General view of the Exhibition just after it was opened by the Prince of Monaco.
In the center of the rectangle are the racers of the restricted and unrestricted classes, with Ursula, the Duke of Westminster's famous Wolseley-Siddeley renamed, at the right in the group of three with their bows away from the reader. The five "Cruiser" classes will be seen around the sides.

The Motor Boat Meet at Monaco.

Some Impressions of the World's Greatest Motor Boating Event, by an Observer. Latest Tendencies in Design and Descriptions of the Principal Performers.

By William Parker.

THE seventh annual motor boat meeting at Monaco which opened formally under the auspices of the International Sporting Club on Friday, April 1st, made, as was expected, a record of 117 in the matter of entries, and on the afternoon of the 1st when the grounds were thrown open by the Prince of Monaco, 85 boats had put in an appearance as against 76 last year. The tennis grounds in the Condamine were gay with bunting and flowers, and advantage was taken of the opening of the new Oceanographical Museum in the principality to make the motor boat inauguration more ceremonial than usual.

The Riviera season had not come up to expectations, but a late influx of visitors due to the interest taken in Rougier's aeroplane exploits and the contiguous aviation meeting at Cannes filled up the little town with a cosmopolitan crowd which followed the motor boats with evident interest. The French element of course largely preponderated, but a good number of Germans, English and Americans and not a few Italians were present on the opening day.

The boats were as usual divided into two general classes, the racers and cruisers, the former again subdivided into two series and the latter into five. First series racers comprised boats carrying a 4 cycle motor with a maximum bore of 155 m.m or its equivalent in H.P., the second or big racer class being unrestricted. The five cruiser series are classed by overall length with the exception of the small single cylinder No. 1 series where the classification is by weight, the maximum with all on board being 650 kilos. This "I. S. C." series are also limited to a monocylindric bore of 100 m.m. or its equivalent.

The little boats have always given good sport, and the class filled well this year, twenty entries materializing, including Sizaire Naudin a single cyl. boat which has already won the monocylinder event twice. Fitted with a new motor of immensely long stroke she develops about 35 H.P. and is unique in her class. Other entries included two Megavets with Labor Felix motors, two of the odd looking but capable Motogodille craft and nine neat looking hulls from the Chantiers d'Antibes fitted with De Dion Buchet and other motors. Cruisers Class II showed 19 competitors, among them the last year's winner Mais-ye-vais-picquer. Labor III, a Despujols hull, was also here last year, but is now fitted with a new Labor Picker motor, a remarkably efficient marine type developing as it does about 60 H.P. at 1400 revs. with cylinder dimensions of 90x210 m.m. Another last year's hull is Gregoire VII and Gregoire VIII, a hydroplane without step also fitted like No. VII with a new Gregoire motor, made a good trial for Despujols in this interesting class. Nautilus Cote I, a hydroplane fitted with a two cycle motor of novel design and skew-geared as before to the propeller, is another interesting competitor, and Excelsior XIII was chiefly notable on account of the fact that she owed her hydroplane outline to a freak of her owner, who converted her at the last moment from a displacement into the gliding class. The veteran Lanturlu-Aster made her third appearance but is now fitted with a new motor designed on good marine lines and capable of running on either petrol or paraffin. The drive to the propeller is through a 50% reduction gear and the cyl. dimensions are 90x200 m.m., generally speaking one of the best sea-going boats shown at Monaco this year.

In the third series (6.50 to 8 metres) cruisers, 19 appeared, among which the new Labor Picker showed many interesting points of design. Her motor is similar to Labor III. Her general lines showed good sea-going qualities and her cardan shaft transmission being a particularly good engineering job. Others were Gallinari-Spa, Paloma with a Brazier motor and hull of Despujols and Nautilus Aya VI, the hull by Blondeau and fitted with a Brasier motor.

The fourth class (8-12 metres) was this year an interesting one and showed 12 entries, among them the 1909 Delahaye-Nautilus IX with her name slightly altered though otherwise little changed, her rudder being now placed aft. The hull is a typical Blondeau hydroplane, the Delahaye motor being

placed well sternwards with skew-drive to the propeller. Other already known boats were Mors Calypso, Bianchi by Despujols, Spa Sallinari and Vedette with hull by Tellier (now achieving fame as an aeroplane constructor), fitted with a Panhard motor. The 30 foot German boat Marga III with a 70 H.P. Dixi motor, the first of her class built in Germany, was an object of interest, a novel point being the arrangement of her propeller in front of the bracket and the fitting of two guiding fins behind with the object of regulating the motion of the wash. The hull by Bauer showed particularly fine workmanship and more is sure to be heard of the type.

The fifth class for big cruisers had three entries, the novelty being the speedy looking Cocorico, a Despujols hull with a Brasier motor. This newcomer's superb lines and general strength and finish were admirable and attracted much notice among the experts. The other boats, Télé Mors, unchanged in outline, and Chanticler II, appeared at last year's meeting, the last named being the winner of the championship as Chanticler. Some slight alteration has this year been made in her hull.

Coming to perhaps the most interesting of all the classes viz., the restricted racers this year had eleven entries of which seven were hydroplanes including, Duc II, a stepless hydroplane by Despujols with a Brasier motor. Her bottom is entirely flat from bow to stern, her total length being 26 feet and the motor placed amidships drives through cardan shafting to a large diameter propeller. Jack, second on the list of the three Despujols, showed fine sea-going lines, and the third, Brasier-Despujols is the sprinter of the three, a single step hydroplane fitted with a 150 H. P. Brasier and showed extraordinary speed capacity and lightness in her design throughout, particularly in such points as the bracketing of the propellers which is extremely light and offering no appreciable resistance to the water.

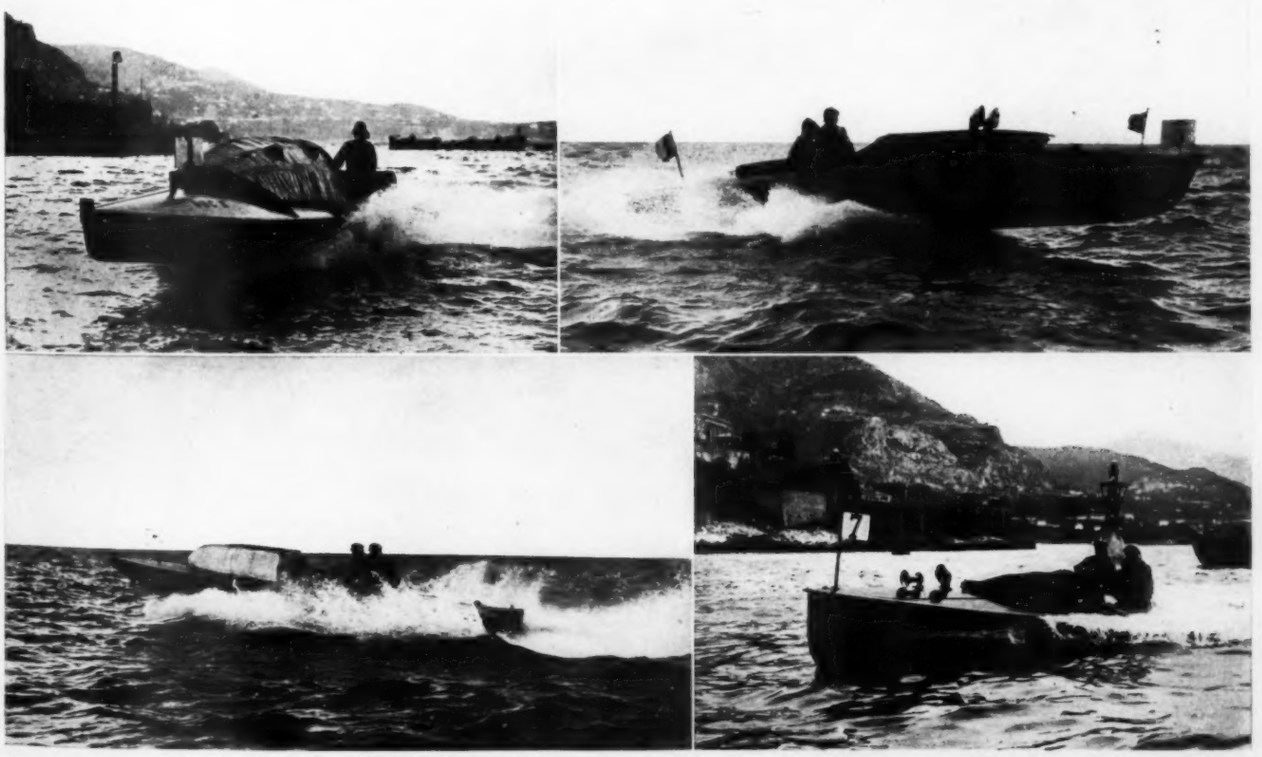
The most "freakish" boat at the show was perhaps M. Volney's La Fléché, a flat box like construction with a single step which is fitted with a flexible bellows-like cushion to take the wave impact after the manner of a air-buffer. She was fitted with a 4 cyl. 155 m.m. bore Labor Picker motor installed in the central hull which stands so to speak on the centre of the raft. The position of the motor which has also some novel features, is close forward, the steering tiller being placed about one-third of the length from the rear.

The two DeKorwin hydroplanes, Soulier Volant and Ricochet XXII, others in this class, attracted much interest on account of their novel lines. The former, the more unique looking of the two, carries a forward "balancing plane" somewhat similar to the Thornycroft "Miranda" type. The rudder lies slightly behind and to the starboard of this and the 40 H.P. motor lies far astern, leaving little more than seating room for the driver. A point to be noted was the placing of the motor out of the central line to counteract screw action, and another is the propeller speed which is estimated at a maximum of over 2000 revolutions.

Ricochet XXII has installed a new "E. N. V." type 60 H.P. motor, but is in other respects unaltered from last year when she made a good impression of her sound lines and evident strength of construction. Others to be noticed in this class are Nautilus-Bayard-Clement with a 150 H.P. Bayard-Clement motor and a typical hydroplane hull of Blondeau, the little Lilliput with an air cooled "F. N." motor, the chief novelty of which is her capability of being folded up in sections when required for transport, and thirdly the British Defender II of Commodore May, now fitted with a Green aero motor of 60 H.P. and an excellent little sea boat capable of good speeds in moderate water. The German entry Lilian fitted with a de Dietrich motor also calls for comment on account of her very superior build and sea-going lines. Altogether this first series class for racers was perhaps the most interesting from the constructors' and designers' point of view of any at Monaco this year.

Coming to the unlimited class, none finally materialized this year to meet Ursula but The Maple Leaf II belonging to Mr. Mackay Edgar, which had the misfortune to be untried and only appeared at the last moment. She embodied extraordinary lightness, her construction being of light cedar and her 400 H.P. Orleans motor, a 12 cyl. model of V type, was noticeable for several novel points such as supplementary exhaust in the cylinder walls and a system of water cooling for the crankcase, the entire construction weighing two tons complete, make her one of the lightest of her class yet built. A good deal of disappointment was shown at the non-appearance of the American Michigan Farcot I and the hurry with which Maple Leaf II was dispatched militated greatly in the public mind against her chances of lowering the Ursula's colors.

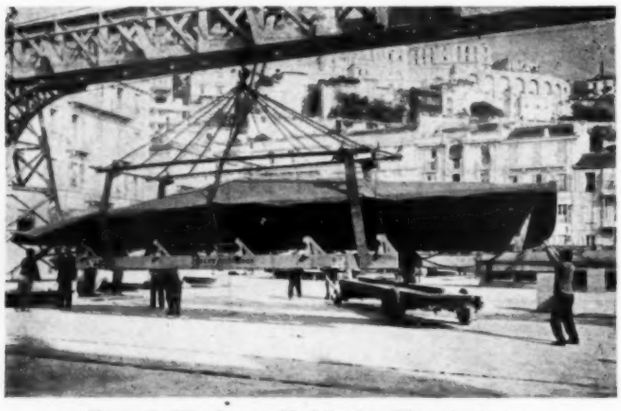
The recent Seine floods were responsible for several abstentions, a thing far from surprising when it is remembered that many of the Paris boat factories and yards were under water only a few weeks ago, and threw all work entirely out of gear for a long period; so much so that the authorities only re-



Duc II, Ricochet XXII, Brasier-Despujols and Lilian, four of the principal performers in the restricted racer class.

Brasier-Despujols, in the lower left-hand photograph, holds the honor of being the only boat that has ever beaten Ursula. In the standing mile and flying kilometer events this little boat, by virtue of its quickness in attaining full speed, was able to beat the famous champion.

ceived many of their most important entries at the last possible moment. That the meeting should have developed into the great success it has been is only another proof of the hold Monaco has on the motor boat world. The fixture has grown in popularity every year and the attendance on this occasion must have been a record. The weighing and measuring of the



Every facility is provided for handling the boats.

boats and the general arrangements were considerably better managed than before and there was no hitch in any department from start to finish, a matter to congratulate the promotors upon when the number of entries was so large. Had the American boat Michigan Farcot, the French Milles Pattes and the other international racers put in an appearance the meeting of 1910 would have been a memorable one. As it was, few of the well known motor boat men were absent on the opening day when in spite of the weather, about as disagreeable as rain and even snow could make it, a huge crowd assembled on the soaking grounds of the Condamine Courts to witness the Prince of Monaco open the exhibition.

As to general tendencies in design there is no doubt that considerable improvement is shown in many of the boats. This, however, cannot be said to mean any great departure from the lines on which the 1909 hulls were modeled which with some modifications and the inevitable number of experimental designs remains greatly the same in the present year. The increase in the number of hydroplanes was expected and they confirmed the impression made last year that they are far from having reached finality either in speed or in sea going qualities. The Fauber hydroplanes in particular, which combine a good many of the qualities of the sea-going craft with the true hydroplane have without any doubt a distinct value for boats of large size.

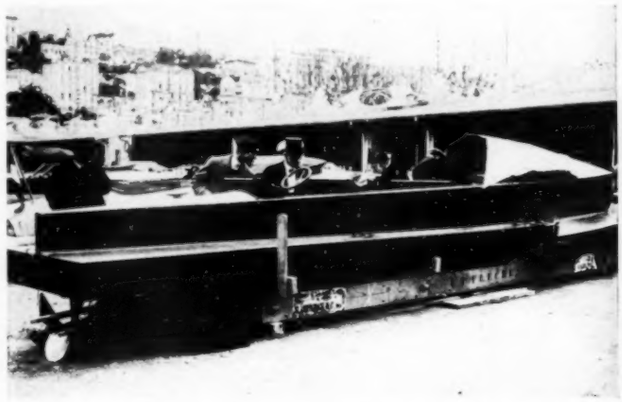
A noticeable point was the better bedding and transmission of the motors which showed considerable crudity up to recent times. There is still room for improvement here, however, though efforts have evidently been made to lower the centres of gravity, correct the obliquity of propeller action, give more stability and balance and also increase the passenger capacity of the cruiser types many of which this year were distinctly more roomy and comfortable than they were last.

Several skew gear transmissions appeared and one or two employed chain driving on the propeller shaft. End thrusts have seemingly been studied and a tendency was shown to place the thrust blocks as close to the screw as possible to avoid any whip action of the long transmission shafting. Motor powers were higher generally particularly in the lighter craft and some of these were installed in a very finished and workmanlike way though it is quite evident the difficult problem of bringing crank and propeller shaft into parallel is yet far from being solved.

The starting gear of some of the power plants is more conveniently placed aft and the accessibility of the motor parts is considerably improved. The perfection of the union of the hull and motor designer is not yet accomplished and as yet a large number of boats are to be seen which indicate that neither fully understood the other's requirements, but were content to do their individual best, leaving the final solution to the arbitrator of actual running.

To the motor and, to a less degree to the transmission, the efforts of the constructors have this year evidently been directed rather than to altering the type of the hull and with the factors connected with the fast hydroplane models still uncertain it is not to be expected that perfection can be reached in one or indeed in several seasons.

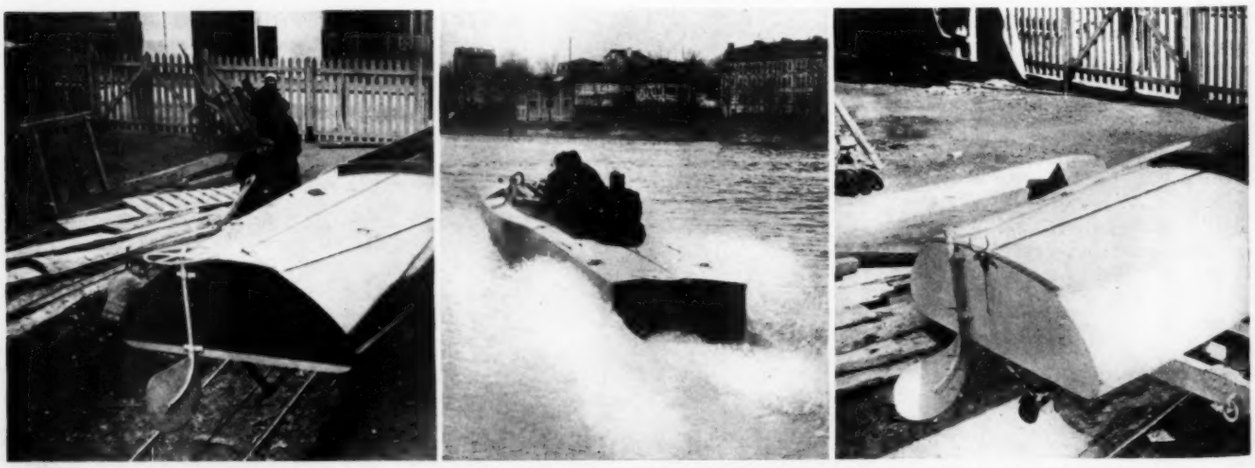
The old rule regulating displacement boats as distinct from gliders which involves the well known formula for speed and power viz., the increase of the latter as the square cube and



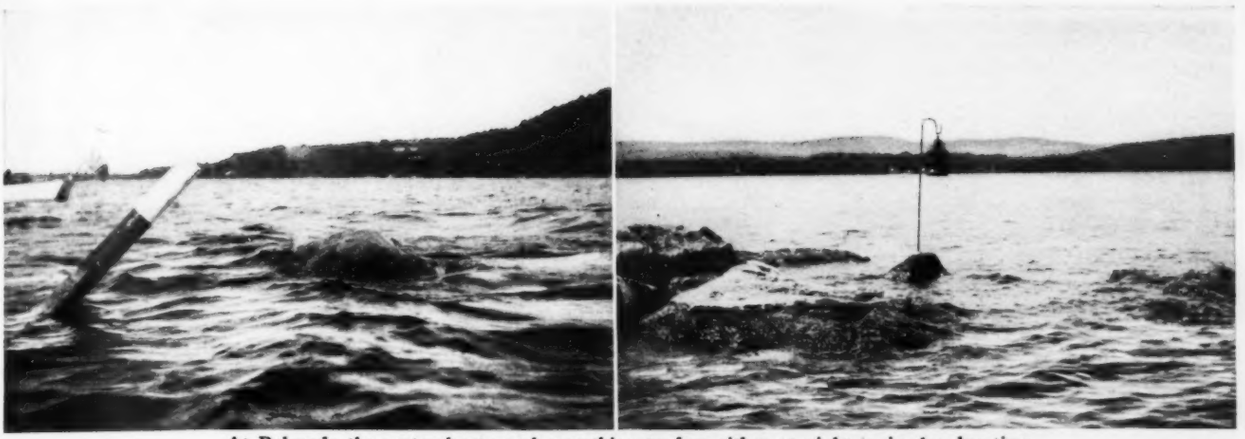
The most radical departure, La Fleche, a hydroplane with boat body, showing rudder hung at starboard quarter and the pneumatic buffers beneath the forward plane.

4th power has been demonstrated to be altogether erroneous in the case of hydroplanes and while the factors of the equation are still unknown the results must be left to constant and repeated experiment.

The Monaco meeting of 1910 must be however regarded as a long step forward in Motor Boat development and the past year showed an amount of engineering skill and expenditure of thought and capital which has certainly been unequalled in previous years.



There is a growing tendency to off-set the rudder. The sterns of three of the Monaco racers with rudders hung to the port of the center line.



At Belgrade the motor boatman has nothing to fear either at night or in the day time.

Making the Small Lakes Safe.

A Great Many of Our Smaller Inland Lakes are Dangerous Places for the Fast Motor Boat. What the Improvements at Belgrade, Maine, Have Done for Motor Boating.

PART I.

By E. S. Lincoln.

THE United States government is continually improving our harbors, dredging and blasting out channels, marking them with buoys, placing light houses and sirens along our coasts and in many other ways improving navigation facilities of our larger water ways and adding to the safety and convenience of the thousands that traverse them. But with the smaller inland waters, the condition, of course, is different. There are countless lakes throughout the country and but a very small percentage of them have undergone even the slightest improvement. Until a few years ago, this problem was of very little importance, but now that the motor boat with its ever advancing speed, is finding its way in greater and greater numbers each season to these hundreds and thousands of little lakes, that such a short time ago knew nothing but a few sail boats and row boats, the problem is a much more important one.

We cannot expect and do not want the government to attend to the improvement of these lakes whose waters are used alone for pleasure and fishing and neither can we expect the state to look after all the lakes and ponds within its territory, and therefore, the duty and pleasure of this work rests with the individual or the community interested. And, accordingly, for the benefit of those lovers of the sport of motor boating, who are interested, as I was, in the improvement of the lake upon which they and their families spend their summer vacations, I have condensed in the following article, our experience in converting one of the most naturally beautiful little lakes in the State of Maine from a place full of rocks, shoals and other dangers to one that may be navigated with perfect safety by the newcomer utterly unacquainted with its peculiarities.

Great Pond, the largest of the Belgrade Chain, is situated 11 miles from Augusta, the capital of the "Pine Tree State." It is noted for its beauty and its bass fishing and every year it is visited by a large number of people. The water for the most part is deep and exceedingly clear, and there are a number of beautiful islands. The shores are wooded with splendid timber and several of the streams which empty into the lake are navigable to the small boat for quite a distance. The lake has a total length of seven miles and its width is about five, so that the total shore line is something like 35 miles. Its long points, bays and coves, its sheltering islands and beautiful scenery all add to the possibilities, and when the writer first visited the lake, a number of years ago, he was much interested in it because of these possibilities. After a thorough investigation, however, it was found that there were numerous dangerous rocks and shoals in unexpected and important places. The soundings would often vary as much as thirty feet within a distance of six feet and at a considerable distance from the shore. There were, of course, no aids to navigation and not even the natives, who had been on the lakes for years, were safe, to say nothing of the numerous visitors. Motor boats began to arrive and as each year powers and speeds were increased, the dangers became correspondingly greater.

This condition exists to-day on the majority of lakes throughout the country and it is the purpose of this article to show how, with the expenditure of a little energy and at slight expense, such a situation can be greatly improved.

With the greater speed of motor boats such dangers are increased.

And now to deal with Belgrade. In 1907 the investigations by the writer were continued and in 1908 the actual work was started. The first necessity was the placing of buoys to expose all dangers and to show their nature. These were of three kinds. First, a ledge or shoal extending out some distance from the shore. Second, one or more submerged rocks at variable distance from the land. And third, long shoals or ledges entirely isolated

from the land and submerged to a depth of from one to three feet. There were also a number of submerged trees coming nearly to the surface of the water. We will take up first a discussion of the construction and placing of the buoys.

Fig. 1. In many places the rocks protrude from the water.

Requirements. The object of a buoy is to expose an existing danger, and to show the navigator his course to avoid the danger. The buoy must be visible for a considerable distance, according to the danger it exposes, and its relation to the other buoys. This is especially important in channels and narrow passageways. Its mooring must be such, that it will not be affected by wind or waves, and must resist the ice during the winter months, and above all things it must be fool-proof. The material entering into the construction of the buoy must be of the very best, in order to insure its permanent location. To fulfill all these requirements is not as easy as it might seem, but unless they are fulfilled the buoy would be a menace to navigation, to say the least. However, common sense, and a lot of practical experience are the main factors required to obtain a lasting and effectual system of buoyage.

Location. On the majority of lakes, it is impossible to carry out the standard system of buoying, as adopted by the United States Government, and this proved a failure at Belgrade, on account of the peculiar shape of the lake. The following illustrations will show the proper locations of buoys, placed according to the dangers they expose. Examining Figure 3, it will be seen that the danger consists of a large sunken rock or bowlder, about six inches under water, and directly in line with the wharf. Such a danger is only local and may be passed on all sides, keeping a safe distance. A buoy painted red is best adapted to expose such a danger, which is least expected, it usually being a considerable distance from the land. In this case the buoy is placed in deep water outside of the rock, so as to assure its permanent location. The deeper the mooring for the buoy, the less it will be affected by the motion of the water. The portion of the buoy exposed above the surface of the water, in this case should be sufficient to enable the boat operator to see it in ample time to pass safely by.

In Figure 4, the case of a long ledge or shoal extending from the land is considered. A black buoy has been found best adapted to expose such a danger, and should be placed at the extreme end of the ledge or shoal, and also in comparatively deep water.

In Figure 5 is illustrated an existing shoal spot, entirely isolated from the land. On account of their irregular shape, they are frequently very hard to buoy. It is good practice to place a white buoy at each end of the shoal, as shown in the figure. If the shoal extends at right angles to these buoys, another set should be placed at A. and B., as indicated.

In case the shoal extends at right angles from the white buoys, but on one side only, three buoys would be used to mark the danger. The three colors mentioned will cover all cases, and are very simple to remember, as for instance, a *red buoy* indicates a rock, *Keep Away;* a *black buoy* exposes an extended shoal or ledge, *Pass Seawards or Outside;* while *white buoys* indicate shoal spots, *Never Pass Between.* In this last case, when the navigator sees a white buoy, he immediately looks for its mate, and the danger is thus exposed.

Placing Buoys. The proper placing of buoys is very difficult, even when the shoal itself is found. This should be attempted only in calm weather, as it is very difficult to do this work with an unsteady boat. Two parties, each in a separate boat, should thoroughly examine the danger and take frequent soundings. The important thing is to be sure that the buoy

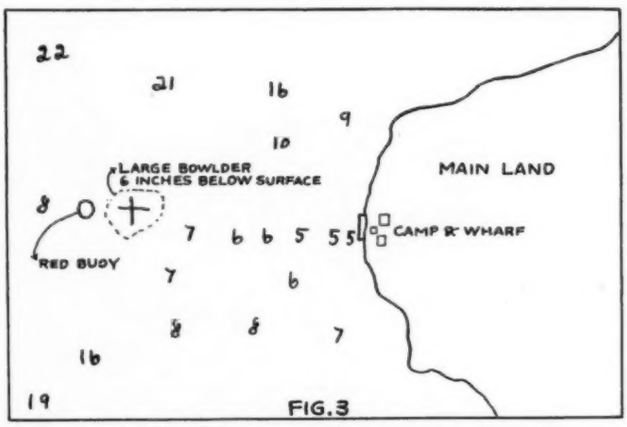


Fig. 3. A single red buoy is used to indicate an isolated rock.

is *entirely outside* the danger it is to expose, otherwise it would be a very dangerous indicator, and would undoubtedly cause disaster. A sounding line should be used to get the depth of the water, when the proper location of the buoy is found, in order to have the chain on the buoy the proper length. In all cases they should be moored in at least seven feet of water, and nine or ten feet, when possible. It is better to have the black and white buoys placed a little distance away from the danger, in case a boat should pass on the wrong side of a buoy. Of course the boat must necessarily pass close to the buoy in order to avoid the danger.

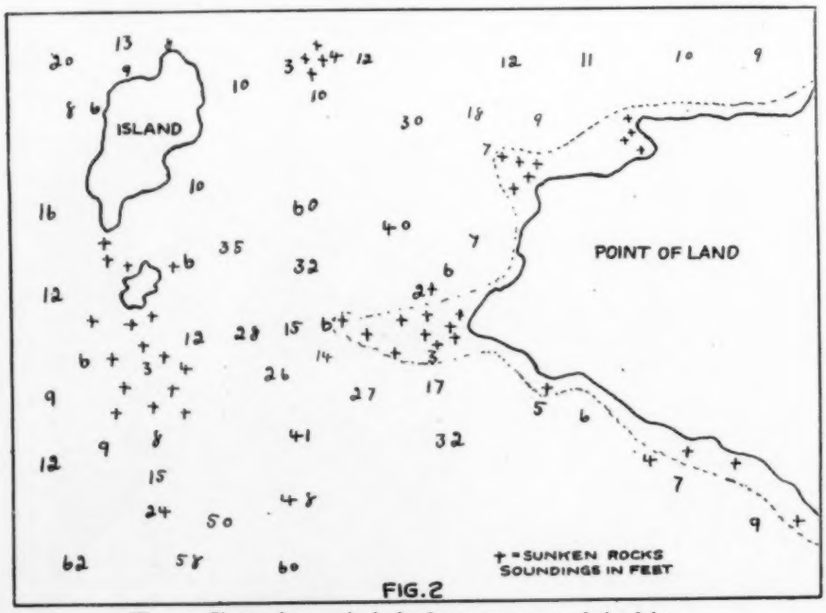


Fig. 2. Chart of a particularly dangerous part of the lake.

Specifications for Buoys. The first thing to be considered is the size of the buoy and the material of which it is to be made. After trying several kinds of wood, cedar was found to be the best. It should be thoroughly dry and as free from cracks as possible. Metal buoys are too expensive for lake use. At Belgrade, a cedar buoy, measuring six feet long and three inches in diameter, was first tried, but proved too small for the work. After making several tests, a cedar buoy measuring twelve feet long and eight inches in diameter, at the butt end, tapering to five inches in diameter at the head end, was adopted. In very exposed places, these dimensions were increased to a length of fifteen feet, with diameter of eight and six inches respectively, and were

found to be sufficient. An ordinary telephone pole, such as used in the country, makes a very good buoy, when cut in halves or thirds, according to its length.

Selection of Type. Buoys for lake use are divided into two classes, spar buoys and keg buoys, barrels or the like. The

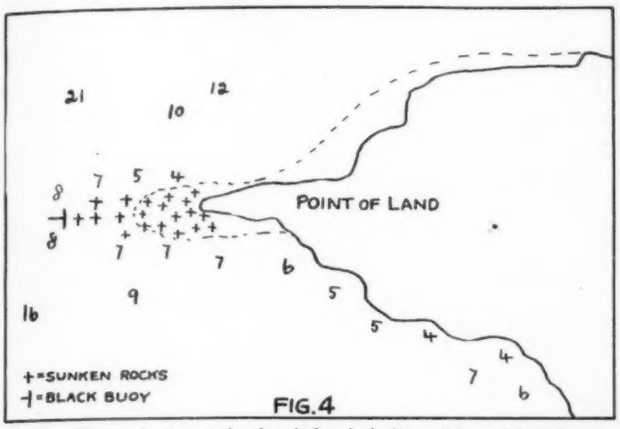


Fig. 4. The end of a projecting ledge is indicated by a black buoy.

following will plainly show reasons why the spar sype of buoy should be adopted.

SPAR BUOYS.	KEG BUOYS.
Advantages.—Can be seen a greater distance. Not injured if run into. Cannot sink. Not affected by waves. Not affected by ice. Disadvantages.—Does not stand at same angle when water changes.	Advantages.—Always floats at same level. Disadvantages.—Cannot easily be seen. Will sink if a leak occurs. Is easily destroyed by ice. Requires a larger mooring, as the waves cause it to jump severely.

As will be seen by the arguments, the spar buoy is to be preferred. At Belgrade, thirty inches of ice forms on the lake every winter, and has in no way disturbed the buoys, and has never moved them. The ice melts out around the buoys, as it passes away. Flags placed on the buoys have been tried, but under the best conditions will only last one season. On small rocks near the shore, an iron rod placed in the rock will prove useful, but is very often broken by the action of the ice. For these "local" rocks, it is better to use a small flag buoy, and take it up at the end of each season. Such a buoy is shown in one of the accompanying illustrations.

All metal fittings, including the chain, should be galvanized. The necessary details and dimensions for fastenings are shown in Figure 6, which also gives details of construction. Just before the buoy is to be planted, the threaded end of the bolts should be headed over with a hammer, to prevent the nuts from coming off.

Fastenings. After the buoy has been selected, the next step is to fasten it to its mooring. At first rope was used for this work, but proved useless for such purposes, and after much experimenting it was found that iron chain and metal fastenings were the only means to be depended upon. This method is shown in Figure 6, which gives the necessary dimensions. The chain should be made of wire, at least one-quarter inch in diameter, and in exposed places, three-eighths inch wire should be used. The iron bar, as shown in Figure 6, is simply a straight bar bent around the end of the buoy, as indicated. These galvanized bars cost about fifteen cents each, and can be purchased at any electrical supply store, under the name of "Cross-Arm Braces". A three-eighths inch carriage bolt should be used to fasten the bar to the buoy, as shown in the figure. Lag screws are not to be recommended and have proved a failure.

Painting. This should be done at least a week before the buoy is to be placed in the water, with two coats of some first class paint. It is better to soak the buoys with oil before painting. The hole for the fastening bolt at the base of the buoy, should be bored before soaking the buoy with oil, and this hole should be filled with either oil or grease. Both ends of the buoys should also be thoroughly soaked with oil and carefully painted to prevent them from rotting. When the buoy is once placed, it is impossible to paint it below the water line, and the ice will undoubtedly scratch the paint above the water line. This, however, can be repainted when the buoy is in position.

In painting the red and black buoys, a foot of same at the top, should be painted white, in order to make the buoy more easily distinguished at night. This band of white at the top of the buoy, makes it very easy to pick up or locate with a searchlight, and is strongly recommended.

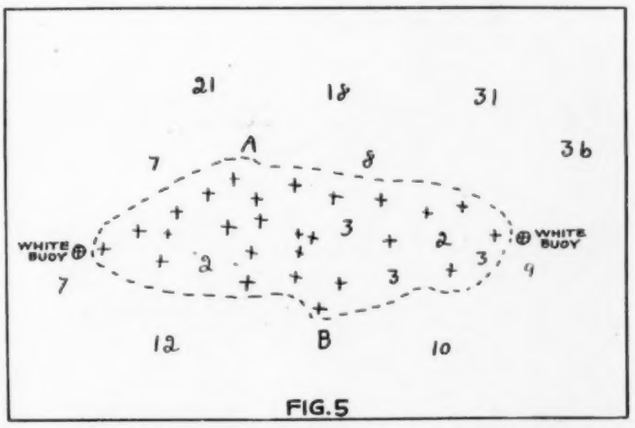


Fig. 5. The method of buoying an isolated shoal.

Moorings. Too much stress can not be laid upon mooring a buoy for navigation purposes. The cheapest and one of the best moorings, is a large rock, which in most localities can easily be found. The rock should be as nearly square as possible, and not weigh less than a hundred pounds. After some experimenting, it was found that a block of concrete about one foot square made the best mooring obtainable. Such a block is made by a mixture of one part Portland cement, two parts of sand, and three parts of broken stone. It will weigh about one hundred and fifty pounds. The chain from the buoy can be imbedded in this block, while it is being made and thus save drilling, which is necessary with a stone.

It might first appear to be an easy matter to find a rock of the right weight and dimensions for this use, but this is not the case, as you will find that most rocks were apparently built for other purposes. To be sure there are numerous rocks, but to get the proper weight, shape and quality for drilling is another matter.

(To Be Continued.)

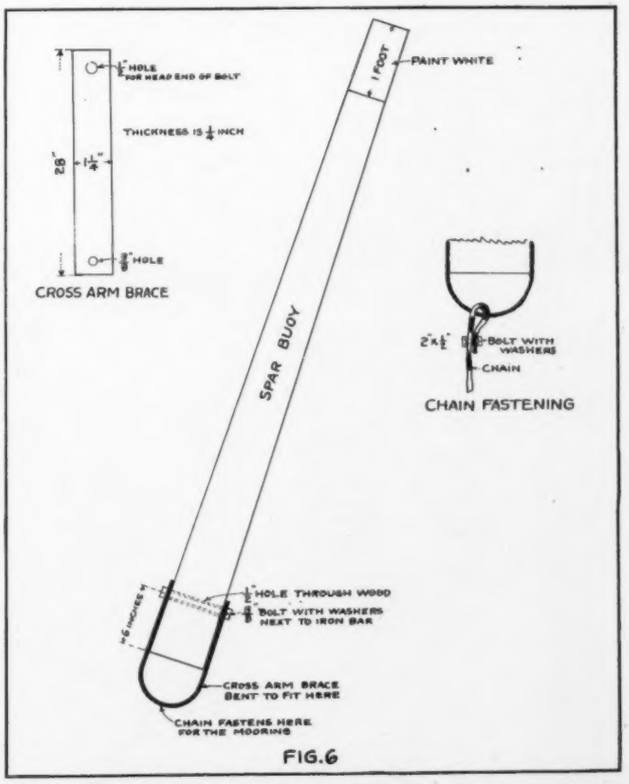


Fig. 6. Diagram of the spar buoy and details of its construction.

If your requirements are the same as mine, Weedlet will fill the bill.

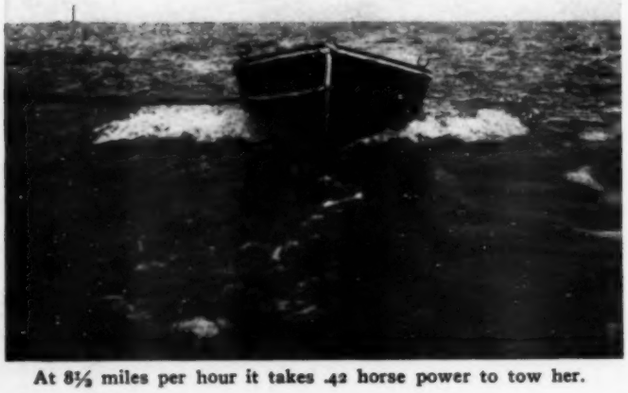
How To Build a 9-Foot Dinghy.

Instructions and Working Drawings* for the Construction of a Motor Boat Tender. Weedlet, a Thoroughly Practical Boat That May Be Built Easily by the Amateur.

By H. P. Johnson.

WHEN I sat down at my board to design a "dink" for my 28 footer Seaweed, the problem looked serious. Of course, she must be as small as consistent with seaworthiness when loaded with five "grown ups". She should tow lightly, so as to obviate the necessity of hauling on deck, and be capable of being towed at 8 miles per hour before the sea kicked up by a 30 mile breeze. Conditions were such that the dink must be hauled ashore when not in use, and left out in the open for a week at a time, and, of course, not leak when wanted, and lastly the cost, and work had to be cut to the minimum.

If your requirements happen to be along the same lines as mine, I'll guarantee Weedlet to fill the bill to your entire satisfaction. When completed she weighs 82 pounds, and I have measured the pull on the tow rope, and find that 8½ miles per hour, it takes .42 h. p. to drag her—the lightest towing boat of her dimensions I have ever seen.



At 8½ miles per hour it takes .42 horse power to tow her.

Well, now, suppose we start to work. It will be much easier if you have the boat up off the floor, so I would suggest that you use two saw horses, and nail them down to keep things from sliding around. For a working base, you can use any heavy timber from 4 in. x 6 in. up, and about ten feet long. Place this on the horses, and nail securely—marking off on it the stations exactly where the stem, moulds, and transom are to come. The moulds you can make of any rough lumber, laying them out according to the drawings. The stem should be cut from 1½ in. oak, with a little natural crook at the end if possible. The transom can be made of cedar, cypress, or, if you care for a nice job, mahogany. You should be able to obtain a piece wide enough to make it of one width. The keel is to be made of ¾ in. cypress or cedar. This will require a board 14 in. wide and 9 feet long. It can be sawed to shape as shown, and beveled before fitting to the moulds.

In setting up, be careful that the moulds are all plumb and square to the center line, and brace them to stay so. Be sure and mark the sheer line and cut out the notches for the bilge stringer. The stem should be mortised into the base block, so that the sheer line is just flush with the top of the block. Nail the keel securely to the stem and transom, fitting in the ¾ in. oak knee to brace it at the stern. The keel can be tacked to the moulds to secure it in place. Fasten the stem and transom securely, as the keel will have quite a little spring to it at first.

The bilge stringers can now be cut out of ¾ in. cypress or spruce, and shaped to fit in the notches in the moulds. It will be much easier to bevel these before, than after putting them on. Nail them securely to the transom, and tack to each mould, fastening them to the stem, so that when the stem is beveled off, a fair line along the stringers will meet in a point at the forward edge of the stem.

The stem should now be beveled to a sharp edge, to fit a batten laid over the moulds, the bevel becoming flatter, as the curve works around to the keel.

Then comes the planking. On account of the full bow, it will be much easier to use for the sides the same stuff as the bottom—regular stock ⅜ in. x 4¼ in. tongue and grooved stuff.

*The working drawings will be found on pages 26-27 of this issue.

They will bend on easily, and should be driven tightly together. Start at the sheer line, nailing securely to the stem and transom, and the third plank will reach the bilge stringer. It should be securely nailed to the stringer, and the edge beveled off fair with the bottom. The bottom planking is now started at the stern, nailing each board at the keel, and to the stringer, cutting off the ends at the same angles as the bottom and sides.

Along about amidship, two boards should be tapered so that they are wider at the bilge than at the keel, giving the planks the little "stagger" as shown in the drawing. This will greatly facilitate the planking when the bow is reached, as there is quite a little twist here. The planks will lap over the stem, being cut off square to the center line.

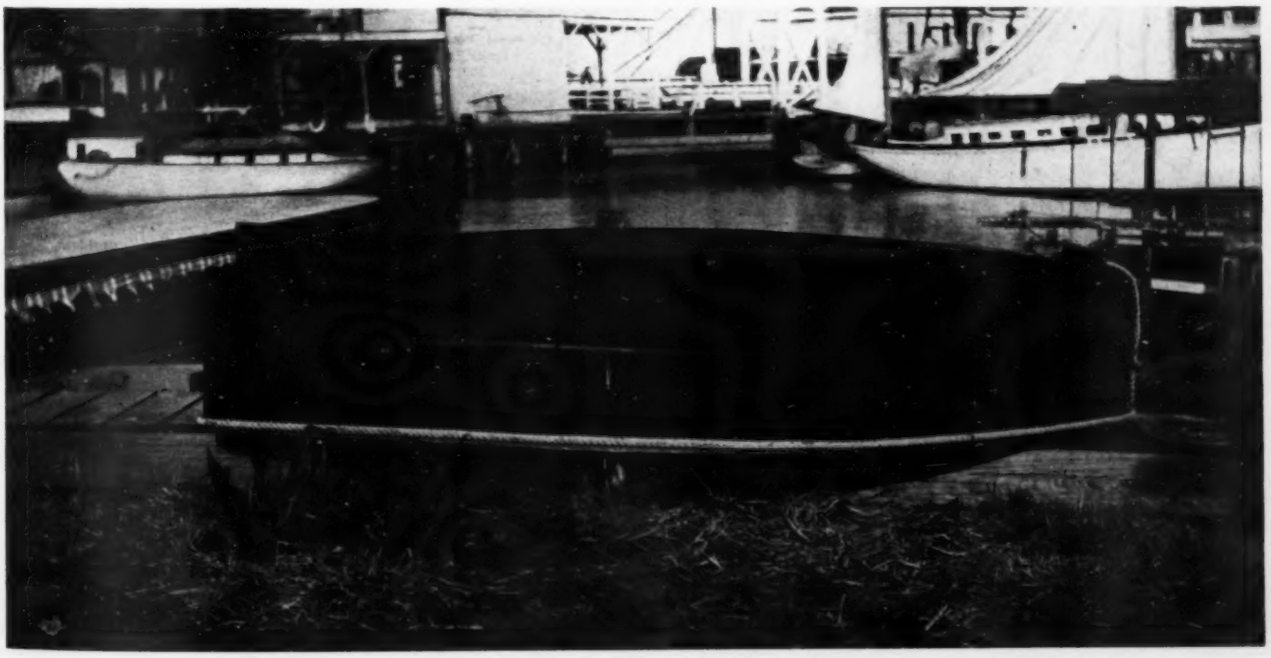
After the planking is completed, punch the nails, and smooth over all the ridges that may show at the plank edges. Do not round off the corners at the bilge or keel. We can now take the 4 in. x 6 in. base off the horses, turn the boat over, and put in the frames, ⅝ in. x 1½ in. cypress, from the bilge stringer to the gunwale. Before removing the two aft moulds, put in the risings, rowing thwart, and aft seat. Be careful, and put in a brace before the forward mould is removed, so that the sides will not spring in. The forward seat, when in place, will hold it permanently. All the moulds can now be removed, and the nails used to hold them backed out.

The outside is to be canvassed, so we are going to need 6 yards of standard 28½ in., 8 oz. duck. Don't make a mistake in getting it any heavier. The keel is not to be canvassed, so we will paint the bottom and sides with a coat of thick paint, and start the canvas. Let it lap about 1 inch over the joint between the bottom boards and the keel, tacking it to the keel with ½ inch copper tacks about ¾ inch apart, close to the selvage. The tacking should be started amidship, working both ways along the keel, stretching tightly. Now stretch tightly, and nail at the gunwale, finally a good hard stretching at the stem and transom will take out all wrinkles. Simply carry the canvas around the corner of the transom and tack it, using plenty of thick paint, the same operation being repeated at the bow. At the gunwale, nail a strip of oak ⅜ in. x 1⅛ in. to cover the edge, and trim the canvas flush with it. At the corner of the bilge, and keel, fasten light strips as shown, to prevent the canvas cutting through. To finish the frame heads inside, run a strip of oak ⅜ in. x 1½ in. flush with the gunwale and securely fasten it at the stem and stern. A small knee at the bow will strengthen things at this point.

Floor boards may be made of two pieces of ½ in. x 6 in. stuff, supported on ½ in. x 1¼ in. strips, to keep them off the bottom. Where the oar locks come, reinforce the sides with a piece of ⅝ inch stuff slipped in between the two frames. Bolt your oar locks on in the beginning and you will save much profanity. When the skeg is fitted as shown, the woodwork is completed.

The dink fender proposition is a real one in itself. I have obtained best results from a 1 inch diameter, cotton rope, run around the sheer, just under the oak strip. Start it at the bow, and continue all around the transom, tying it to the boat with marline worked thro the strands of the rope and tied thro holes in the planking. At the bow, make a one turn, and pass one end over the top of the stem, nailing it securely. Continue the other end down the face of the stem, nailing it on securely, and run it well back on the keel. The painter should be placed near the waterline. Bore a hole through the stem, fit a piece of lead pipe to the hole and flange the ends.

Weedlet's seating arrangement will accommodate five persons.



The outside is canvassed and a one inch cotton rope is run around the sheer to act as a fender.

New Motor Boat Bill Before Congress

It Provides for a Classification of Motor Boats and Would Take the Burden From the Little Fellow. Summary Showing Where and How Its Passage Will Change Existing Laws.

A NEW bill of vital interest to motor boat men has been introduced recently before Congress. This bill, or bills, as there is one before both the Senate and House of Representatives, known as "S.7359" and "H. R. 23373", respectively, will, if enacted, greatly improve conditions for motor boatmen and especially the owners of smaller craft.

The new bills provide for the following classification of motor boats, which term, by the way, includes all boats under 65 feet in length, propelled by mechanical means other than steam:

Class 1, boats less than 25 feet in length.

Class 2, those of 25 feet and over, but less than 40 feet in length.

Class 3, forty feet and above, but less than 65 feet in length.

Section three of this bill provides that in lieu of the lights prescribed by rules three, five, six and seven of Section 4233 of the Revised Statutes and the two Acts approved June 7, 1897, and February 8, 1895, and known as the Seaboard Law and the Great Lakes Law, respectively, motor boats shall carry, subject to the penalties prescribed in these acts, the following lights and no other lights that may be mistaken for them:

All motor boats of Class 1, first a white light aft to show all around the horizon, and second, a lantern in the forward part lower than the white light aft and showing green to starboard and red to port and so arranged as to throw the lights from straight ahead to two points abaft the beam on their respective sides.

All boats of Classes 2 and 3, first, a bright white light in the fore part so constructed as to show an unbroken light over an arc of the horizon extending 10 points aft on either side and with lenses for Classes 2 and 3 of 19 and 31 square inches respectively; second, a white light aft to show all around the horizon, and third, the usual red and green lanterns, the lenses of which must be 16 square inches in area for the Class 2 boats and 25 square inches for those of Class 3.

A provision of particular interest to the small boat owner is that in Section four which is to the effect that motor boats shall not be required to carry the whistle or siren, fog horn and bell prescribed by the above mentioned acts and Revised Statutes, but instead of these shall carry and use subject to the penalties prescribed in these laws, the following: Boats of all three classes, a whistle or other sound producing mechanical appliance capable of a blast of two seconds or more duration, which shall be deemed a "prolonged blast", instead of from four to six seconds as stipulated in the existing laws. Boats in Classes 2 and 3, an efficient fog horn and also an efficient bell, which for the latter class shall not be less than eight inches in diameter.

Regarding life preservers, provision is made in Section five that all boats shall carry life preservers, life belts, buoyant cushions or ring buoys sufficient to sustain afloat every person on board and so placed as to be readily accesible, and for failure to carry such appliances as prescribed, the owner shall be liable to a penalty of $10 for each person for whom such appliance has not been provided.

In regard to fire extinguishers, no provision is made for boats included in Class 1, but all in Classes 2 and 3 are required to carry ready for immediate use the means promptly and effectually to extinguish burning gasoline, and for any failure to carry such means the owner shall be liable to a penalty of $25 which shall not be mitigated.

The division into classes, according to length is, after all, the only practical method of classifying motor boats, as when tonnage is used as a basis of classification there is infinitely greater possibility of error, for in every case the tonnage must be determined by measurement and calculation. It will be seen by a glance at the table that the new bill, while providing sufficiently for the small boat, does not put an unnecessary burden on it. Under existing conditions every boat, regardless of size, must be provided with a bell, a fog-horn and a whistle capable of a blast of from four to six seconds. And in the matter of lights, too, the condition is hardly satisfactory for all boats (with the exception of those under ten tons, which may in bad weather carry a combination lantern) must carry two white lights together with separate side lights and their prescribed screens, which is manifestly an unnecessary precaution.

The bill before the Senate was introduced by Mr. Nelson for Mr. Frye and has been referred to the Committee on Commerce. That before the House of Representatives was introduced by Mr. Greene and has been referred to the Committee on the Merchant Marine and Fisheries. It is perhaps unnecessary to suggest that all motor boatmen urge their representatives in Congress to favor the passage of these bills.

Table showing wherein the new bills differ from existing laws.

	Proposed Bill S.7359; H.R. 23373	Seaboard Law Act of June 7, 1897	Great Lakes Law, Act of Feb. 8, 1895	Gulf Rivers Law, Sec. 4233, R.S.
LIGHTS				
Boats under 25 ft. long				
White lights	One aft, showing around horizon	Range of 2 lights; forward showing 5 miles; light aft, 15 ft. higher than forward, and showing around horizon	Forward showing 5 miles and 20 ft. above hull	Range of 2 lights; light aft 15 ft. higher than light forward and showing around horizon
Side lights	Combined green and red lantern forward	Starboard green and port red, each showing 2 miles, with 3 ft. screens (vessels under 10 tons in bad weather may carry portable green and red lanterns, to be displayed on approach)	Same as seaboard	Same as seaboard
Boats from 25 to 65 ft. long				
White lights	One forward at stem and one aft showing around horizon—minimum lenses defined	Same as white lights above	Same as white lights above	Same as white lights above
Side lights	Starboard green and port red—minimum lenses defined; screens 18 to 24 inches	Same as side lights above	Same as side lights above	Same as side lights above
SOUND SIGNAL APPARATUS				
Boats under 25 ft. long				
Whistle	Efficient whistle sounding blast of 2 seconds	Efficient whistle sounding blast of 4 to 6 seconds, sounded by steam or substitute	Efficient whistle audible 2 miles	Whistle 8 ft. above deck
Foghorn	None	Efficient foghorn	None	None
Bell	None	Efficient bell	Efficient bell	Bell
Boats from 25 to 65 ft. long				
Whistle	As above	As above	As above	As above
Foghorn	Efficient foghorn	Efficient foghorn	None	As above
Bell	Efficient bell (8 in. in boat over 40 ft.)	Same as above	Same as above	Same as above
	Proposed Bill S. 7359; H.R. 23373		Existing Law, Sec. 4426, R.S.	
LIFE PRESERVERS	All motor boats, whatever their length, shall carry life-preservers, life-belts, buoyant cushions, or ring buoys sufficient to sustain afloat every person on board, and so placed as to be readily accessible		All vessels of 15 gross tons or less propelled in whole or in part by gas, gasoline, petroleum, naphtha, fluid, or electricity, and carrying passengers for hire, shall carry one life-preserver, of the sort prescribed by the regulations of the board of supervising inspectors, for every passenger carried. (This will not be repealed by the bills.)	
FIRE EXTINGUISHERS	All motor boats over 25 ft. shall carry ready for immediate use the means of promptly and effectually extinguishing burning gasoline		Nothing	

Navigating the Upper Hudson.

Suggestions for Those Making the Trip to Lake Champlain, the Great Lakes or the Thousand Islands. The River Between New York and the Canals, Not Covered by the Government Charts.

By Walter W. Brinckerhoff.

THE Hudson has been called the Rhine of America, and from people who have seen both, I have it that in so far as beauty goes, the Hudson far exceeds the Rhine. There is no river that affords a more safe and pleasurable run for a motor boat, nor one that speaks of history at every turn so much as does the good old Hudson. Last fall the historical celebration gave a new interest in this river to a great many people, and where in 1809 there was one power driven craft on its waters, now there are countless numbers, and a large majority are motor boats.

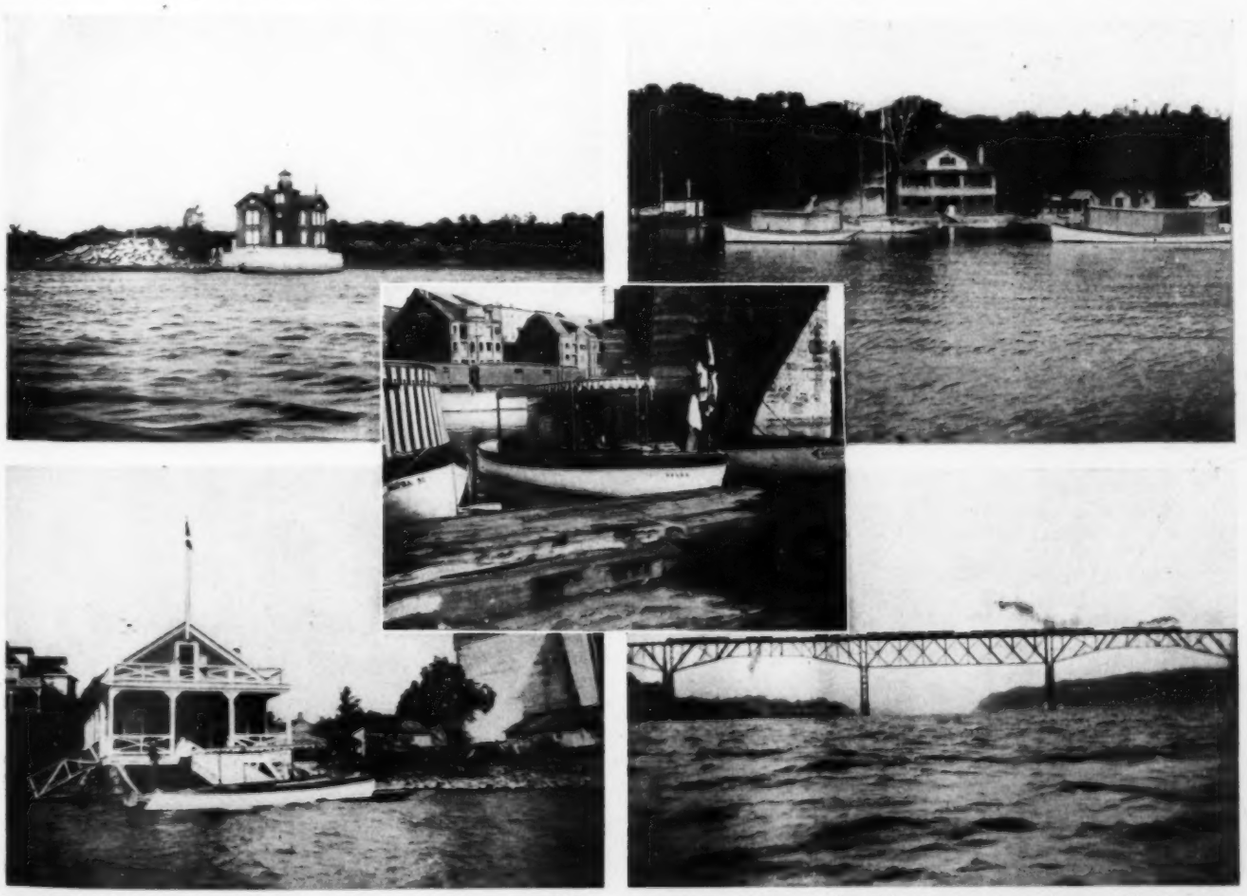
In going north you first pass the Palisades, a solid mass of rock rising from the very shore; then the majestic Highlands; beyond, the land of beautiful estates and farms; then the low lands which form a fit approach to the Catskill Mountains that tower to the heavens, all combining to make a trip ideal.

I offer the following suggestions, photos, and map of the upper Hudson as collected by me on my three round trips over the ground in a 24-foot motor boat, and which I am sure will be of help to those making the trip for the first time, and quite possibly to some who have already made the trip.

The government issues three regular charts of the Hudson; No. 281—New York to Haverstraw, No. 371, Haverstraw to Poughkeepsie, and No. 372a, Poughkeepsie to Hudson City, which if followed will safely take a boat as far as they go, but let me make mention of a few places to watch out for. At Peekskill, unless you are going to stop there, keep on the west side of the center, as all the bay in front of the town, with the exception of a narrow channel fairly close to the shore, is filled with weeds. From here, on the northeast shore Anthony's Nose rises up from the water, and the railroad has cut a tunnel through its base. You may run fairly close to this point and then straighten out your course along the east shore up to West Point. Right off the point shore, from just above the station to the very point, there is a heavy growth of weeds extending about a quarter of the way across the river. Therefore, keep in the center or to the east of it until you have a clear view past the Point and Constitution Island. A little further on the east is the town of Cold Spring, where good anchorage is to be had for small boats up the creek.

Off Fishkill, the flats have heavy vegetation and are dangerous to safe navigation, so hold over toward Newburgh. At the latter place, north of the town proper, is the Dock Rats Yacht Club where you are sure of a welcome and where you may obtain gasoline and supplies.

With ordinary care you will have no trouble, and at Poughkeepsie the Yacht Club is very homelike and handy for supplies. Eight miles further on is Esopus Island with a good channel on both sides, and an ideal spot for a camp. Then Esopus Light appears to be in the middle of the river, but be sure to keep on the east shore, as the Light is on the edge of a big flat covered with weeds and running out from the west shore. Then around the next bend you will see Kingston Point on the west, with the park and boat landing, just north of which is the Roundout Yacht Club, another place where you will find fellow motorboatmen. From here you will find the west channel the easiest to follow by keeping about 100 to 200 feet out from the docks, till you reach Turkey Point, when you want to head for the summer house on Cruger Island and up along that shore past Magdelin Island. Soon Saugerties Lights beacon you over to the west again, but by following the buoys you should have no trouble, only remember that the Government has put all marks there for a purpose.



Landmarks of the upper Hudson. Above on left, Stuyvesant Light; on right, Dock Rats Yacht Club, Newburgh. Below on left, Roundout Yacht Club, Kingston Point; on right, Poughkeepsie Bridge. In cen ter, the landing at the Albany Yacht Club.

Keep to the east of Upper Coal Beds Light and along that shore past Germantown when the river swings around to the west and until the big yellow ice house at Catskill comes in view, and by holding close to it you can run up the creek for quite a ways. Just in from the river on the north side is the Catskill Yacht Club, where they make visitors feel quite at home. Across the creek is a good place to anchor, away from the swells of the big boats, by dropping your hook 50 to 60 feet from the shore, and then backing in to the wall and making a stern line fast. In this way, tied for'n-aft, you will not swing on the tide nor be in the way of other boats, which usually are numerous at this place. Two or three gasoline stations are a little ways up the creek where can be purchased all you want, and a short walk will land you right among the stores.

Leaving here, keep close to the north side of the creek until you round the big ice house and then keep the west shore up past the black spindle and the red spar off Rogers Island and on the Percy Reach Light and Hudson Light. As the map shows, there is a channel on both sides of Hudson Flats, but if you are going to run right through, I advise the west one at about half way from the shore to the flats, the tops of the weeds on which can be seen at all stages of the tide. However, if a stop is to be made at Hudson, cross over below the Light House, which is a big stone affair, and I understand a dock just north of the ferry slip is the best place to tie up. The channels join again just north of the buoy at the upper end of the flats and runs on the east of the black spindle and then right for Four Mile Light. Off the town of Stockport there is a flat in the middle of the river with a channel on both sides, but unless you are going to stop at that town, take the west one which is by far the easier to follow and which gives plenty of water for a motor boat.

Follow the west shore until nearly to the town of Coxsackie when you must head for Nutten's Hook, a point on the east shore, after which you cross back to the east shore of Coxsackie and Light House Islands, which may be held close aboard and then round the red spindle and cut just past the end of Bronx Island heading for the stone light house on the east shore above Stuyvesant and called Stuyvesant Light. The town of Stuyvesant is just above Nutten's Hook, and if you wish to make a call there, remember this: To get there safely you want to follow the channel up a little past the south end of Bronx Island, then cut straight over to the east and run down close to the shore until you come to the docks. This is necessary as right in front of the docks is a big flat, from which I once had the pleasure of hauling an unfortunate boat.

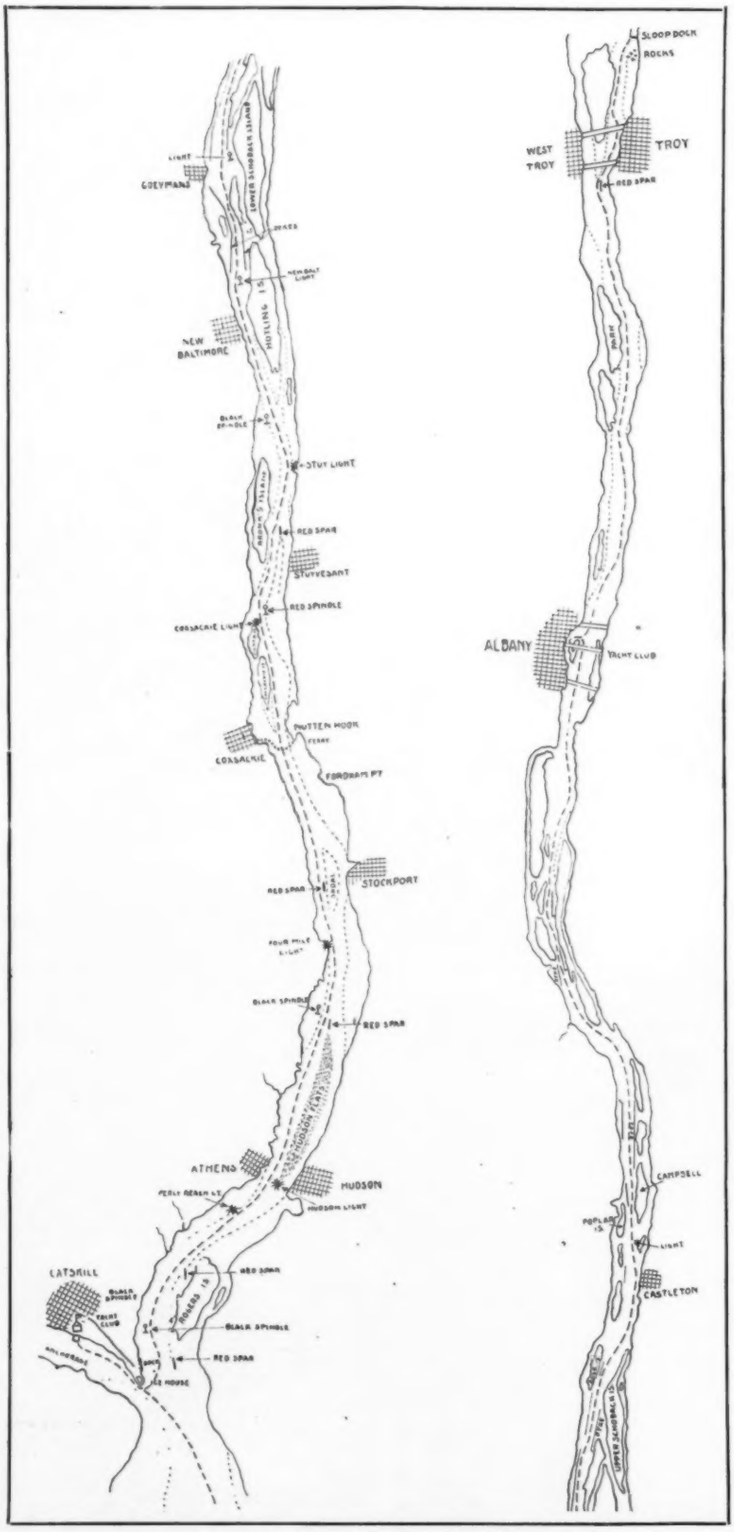


Chart of the Hudson River from Catskill to Troy.

Continuing our trip, run in fairly close to Stuyvesant Light and then head north past the black spindle and Hotaling Island until you come to New Baltimore, 7½ miles above Coxsackie. In going north I doubt if you have any trouble, but in coming back, the tendency is strong to cut from New Baltimore to Bronx Island, so remember that Stuyvesant Light must be passed close aboard in going both ways. Run in fairly close to the town and head up to the west of the light.

Here the government dykes start and run most of the way to Troy, and make navigation very easy. There are lights and marks on both sides which if followed will make this about the simplest stretch to get over, and where the river makes a turn it is safe to judge that the deepest water is on the outside of the turn. A little ways on is the town of Coeymans and then comes Castleton, both of which make nice stopping places. From the latter the map shows the channel running over by the west shore past Campbell Island and then somewhat on the east shore up to Albany. The Albany Yacht Club is noted for hospitality, and to find their docks you run up past the night boat dock and when you come to an opening in the river wall just beyond the second bridge, turn in and there you will find a large fleet at the docks where you may also make your headquarters, get gasoline and supplies from the genial steward. If your intentions are to sleep on board, I advise that you anchor across the river where you will not have freight trains rumbling over your head, which is not conducive to quiet sleep.

From here to Troy is a run of 7 miles and a channel that is easy to follow between the dykes until nearing the above city when you will see a red spar off a flat extending out from the east shore. Don't let the people at Albany scare you by saying the channel is treacherous, for with a little care you will have

(*Continued on page 50.*)

Navigation for the Motor Boatman.

The Principles, Which if Mastered, Infinitely Increase the Possibilities of Motor Boating. For the Motor Boatman Who Is Not Content to Hug the Shore.

PART II.

By Capt. B. D. Reese.

Latitude and Longitude.

THE positions of places on the chart is always expressed by giving their latitude and longitude.

Latitude is the distance of a place north or south of the equator.

Longitude is the distance of a place east or west of the meridian of Greenwich.

These distances are always expressed in degrees, minutes, and seconds. Marked ° ′ ″.

Their divisions are:

60 seconds = 1 minute.
60 minutes = 1 degree.
90 degrees = 1 quadrant.
4 quadrants = 1 circle.

Care should be taken at first when adding or subtracting these quantities not to handle them like dollars and cents.

To find the difference of latitude between two places. If they are of the same name, i. e., both *North,* or both *South,* take their difference; but, if they are of different names, i. e., one *North* and the other *South,* take their sum. It is customary to mark the place you are from, as A, and the place you are bound to as B, thus:

Latitude A	37° 26′ N.
Latitude B	31° 44′ N.
Difference	5° 42′ S.
	60
	342 minutes or miles

The difference is marked S, because B is south of A. Should the latitude of A be less than that of B, the arrangement should not be changed, but the upper subtracted from the lower.

I. Find the difference of latitude between the following places:

1. Latitude	A	53° 18′ N.	2. Latitude	A	43° 27′ N.
"	B	39° 12′ N.	"	B	27° 43′ N.
3. Latitude	A	24° 27′ N.	4. Latitude	A	31° 57′ N.
"	B	33° 46′ N.	"	B	42° 25′ N.
5. Latitude	A	4° 21′ N.	6. Latitude	A	12° 27′ S.
"	B	6° 43′ S.	"	B	23° 58′ N.

Difference of Longitude.

The difference of longitude between two places is found by the same rule as the difference of latitude. When they are of the same name, subtract them. When of different names, add them. When the sum of the longitures exceeds 180 degrees, subtract the sum from 360 degrees, so as to get "the shortest way round."

Find the difference of longitude between A and B, when

Longitude A	134° 57′ W.
Longitude B	128° 47′ E
Difference	263° 44′ W. greater than 180°
Subt. from	360° 00′
Difference	96° 16′
	60
	5,776 minutes

The "miles" of difference of longitude are always termed minutes, as they are never actual miles except on the equator; unlike the miles of latitude, which are everywhere equal to a geographical, or, in navigation, a nautical mile.

II. Find the difference of longitude in the following examples:

1. Longitude	A	87° 58′ W.	2. Longitude	A	75° 23′ W.
"	B	54° 36′ W.	"	B	67° 48′ W.
3. Longitude	A	17° 28′ W.	4. Longitude	A	57° 51′ W.
"	B	36° 09′ W.	"	B	63° 11′ W.
5. Longitude	A	14° 27′ E.	6. Longitude	A	7° 57′ W.
"	B	12° 33′ W.	"	B	10° 48′ E.
7. Longitude	A	137° 25′ E.	8. Longitude	A	97° 47′ W.
"	B	148° 53′ W.	"	B	99° 13′ E.

Middle Latitude.

The middle latitude of two places is the latitude of a parallel midway between the two places. If the given latitudes are of the same name, i. e., both north, or both south, *add them.* If they are of different names, i. e., one north and one south, *subtract them.* The result divided by two is the middle latitude.

Meridional Difference of Latitude.

A chart has been described as "a map of the ocean on which the earth is represented as a flat surface." In order to do this, the degrees of longitude which really taper from the equator towards the poles are all made of equal lengths; and to compensate for this the degree of latitude are each made correspondingly longer.

The number of actual miles measured on the meridian from the equator to any point in latitude is given in a table (Table 3, Bowditch) for every degree and minute of latitude. The difference between any two of these quahtities will be the "Meridional Difference of Latitude" between the two places. The difference between the numbers given for any two adjoining degrees of latitude will be the length of that degree of latitude to the same scale as the degree of longitude is made equal to 60 miles.

To find the meridional difference of latitude:

CONTRARY names.....ADD
SAME names.....SUBTRACT

But to find the middle latitude:

CONTRARY names.....SUBTRACT
SAME names.....ADD

III. Find the difference of latitude, middle latitude and meridional difference of latitude in the following positions:

Lat. A	37° 26′ N.	37° 26′ N.
Lat. B	21° 47′ N.	21° 47′ N.
Diff.	15° 39′	2)59° 13′
	60	Mid Lat. 29° 36½′
In Miles	939	

Mer. Pts. (Table 3)	2411.3
Mer. Pts.	1331.2
Mer. Diff. of Lat.	1080.1

1. Latitude	A	54° 37′ N.	2. Latitude	A	43° 15′ S.
"	B	43° 54′ N.	"	B	24° 48′ S.
3. Latitude	A	17° 25′ N.	4. Latitude	A	36° 21′ S.
"	B	8° 46′ S.	"	B	27° 58′ N.
5. Latitude	A	25° 34′ S.	6. Latitude	A	23° 57′ S.
"	B	63° 22′ S.	"	B	51° 23′ S.

The reader should practice these examples until he is thoroughly familiar with them.

The Chart.

A chart is a map of the ocean, on which the earth is represented as a plain surface. On it are marked the meridians of longitude; parallels of latitude; coast lines; shoals, soundings or depth of water; lighthouses; light vessels; buoys and anything of importance to the navigator. At frequent intervals a compass is placed, on which is marked the variation for that locality. Soundings on the plain surfaces are in fathoms, on the dotted surfaces in feet. Distances of latitudes are measured on the meridians, and longitudes are measured on the parallels.

Charts of the coast have the compasses on them usually marked "Correct Magnetic." The courses found from these compasses are the courses to be steered by a wooden vessel, unless she has a cargo of iron. The disturbance of the compass caused by large masses of iron will be considered later.

The Use of the Chart.

1. To find the course and distance between any two places:

Lay the edge of a parallel ruler over both places, then carefully preserving the direction, slide it to the center of the nearest compass and read off the course. Place one point of of the dividers on each place and measure the distance on the meridian.

2. To find the position of the ship by simultaneous bearings of two known objects:

Lay the parallel rulers to the observed bearing on the nearest compass, move it to the object and draw an indefinite line. Do the same with the other bearing, and the intersection of these two lines will be the ship's position.

3. To find the position of a ship from two bearings of the same object and the known course and distance run between observations:

With the parallel rulers draw an indefinite line to represent each bearing through the object observed. Then with the parallel ruler on the course steered, from any point on the first bearing draw a line, and with the dividers measure off on it the distance run. Next place the parallel on the first bearing and move the edge over the end of the distance. Through this point draw a line to intersect the second bearing. This intersection will be the ship's position.

4. To find the course to steer to counteract the effect of a known current, and the distance she will make good per hour towards port; the ship's speed being given:

On any one of the compasses on the chart draw indefinite lines on the given course and the set of the current. On the set of the current lay off the amount of the drift to any scale. Then take the ship's speed in the dividers to the same scale, with one foot at the end of the drift, sweep an arc with the other through the line representing the course. The line joining these two points will be the course to steer, and the distance from the center of the compass to the end of the triangle will be the distance made good per hour towards port.

In the following exercises, the sets marked II. and III. should have the latitude and longitude of the place found given for an answer.

Chart Exercises.

I. Find the course and distance from:

1. N. E. End lightship to Fire Island lightship.
2. Barnegat Bell Buoy to Ambrose Channel lightship.
3. Overfalls lightship to Five Fathom Bank lightship.

II. Find the ship's position

1. When Barneget lighthouse bears north, and Tucker's Beach lighthouse bears W. ½ S.
2. When Absecon lighthouse bears N. N. E. and Hereford Inlet lighthouse bears west.
3. When Barnegat lighthouse bears S. W. and Sea Girt lighthouse bears N. W. by N.

III. Find the ship's position.

1. When Barnegat lighthouse bore N. W. by N. and after steering N. by E. ½ E. 8 miles it bore W. ½ S.
2. When Cape May bore N. W. by W. and after steering W. ½ S. 9 miles it bore N. by W.

3. When North East End lightship bore S. W. and after steering W. by N. 6 miles it bore south.

IV. Find the course to steer and the distance the ship would make good per hour towards port, when course, current and speed are as follows:

Course	Current	Ship's Speed
N.E.	S. by E. 3 miles per hour	9 miles
N.W.	North 4 " " "	12 "
W. by N.	S. ½ W. 2½ " " "	10 "
N.W. by W.	W. by N. 2 " " "	8 "
E. by N. ½ N.	W.S.W. 3 " " "	9 "

The above exercises can all be solved on the Coast & Geodetic Survey Chart No. 8. Gay Head to Cape Henlopen.

They should all be carefully done over and over, until the student is quite sure he can DO them at any time without referring to any instructions. There is no time to study on a dark night when it is blowing hard.

In fine weather, with a fair wind and a smooth sea, a vessel will make good the course steered by compass, and the distance indicated by her log. These records can be transferred to the chart thus showing graphically where she is getting to.

The first course is laid off from the point of departure, a faint pencil line drawn on it, and the distance measured off. The distance must always be measured on the meridian or the scale of nautical miles; unless the log is made for statute miles. Great care should be taken to be sure what kind of miles it registers.

Lay off the following courses and distances, and give the latitude and longitude of the place arrived at, and the course and distance made good:

1. From N. E. End lightship sailed the following courses and distances:

E. ¼ S. 19 miles; E. ¾ N. 24 miles; E. S. E. 17 miles. East 20 miles; W. N. W. 53 miles. Find the present position and the bearing and distance of the buoy off Great Egg Inlet.

2. From 5 Fathom Bank lightship sailed the following courses and distances:

N. E. 23 miles; E. by N. 26½ miles; N. E. by E. 21 miles; N. E. by N. 27 miles. Find the present position, the course and distance made good, and the bearing and distance of Barnegat lighthouse.

3. From the whistling buoy off Absecon sailed the following courses and distances:

N. E. by E. ½ E. 41 miles; S. E. by E. 9 miles; N. N. E. 30 miles. Find the present position, the course and distance made good, and the bearing and distance of Fire Island lightship.

4. From the Ambrose Channel lightship sailed the following courses and distances:

S. E. ½ S. 22 miles; S. S. E. 32 miles; S. by W. 37 miles; W. by N. 18 miles. Find the present position, and the bearing and distance of Absecon lighthouse.

5. From the bell buoy off Barnegat sailed the following courses and distances:

E. by N. ¼ N. 36 miles; E. ¼ S. 27 miles; N. N. W. 24 miles; East 48 miles; N. N. W. 18 miles. Find the present position and the bearing and distance of Montauk Point lighthouse.

Answers to the Examples in This Issue.

I. Difference of latitudes:

(1). 846′ S. (2). 944′ S. (3). 559′ N. (4). 628′ N. (5). 664′ S. (6). 2195′ N.

II. Difference of longitudes:

(1). 2002′ E. (2). 455′ E. (3). 1121′ W. (4). 320′ W. (5). 1620′ W. (6). 1125′ E. (7). 4422′ E. (8). 9780′ W. (8). 9780′ W.

Note: If the sum of the longitudes is more than 180°, subtract it from 360° and change the name.

III. Mid. Lat. and Mer. Diff. of Lat.:

	Diff. Lat.	Mid. Lat.	Mer. Diff. Lat.
1.	643′ S.	49° 15½′ N.	977.8
2.	1107′ N.	34° 1½′ S.	1340.6
3.	1571′ S.	4° 19½′ N.	1579.0
4.	3859′ N.	4° 11¼′ S.	4067.0
5.	2268′ S.	44° 28′ S.	3355.3
6.	1646′ S.	37° 40′ S.	2115.9

Chart Problems.

I.

1. Course N.E. ¼ N. Distance 107 miles.
2. Course N.N.E. ¼ E. Distance 42 miles.
3. Course W.b.N. Distance 21 miles.

II.

1.	Latitude 39° 33′ N.		Longitude 74° 04′ W.	
2.	" 39° 02½′ N.		" 74° 54′ W.	
3.	" 39° 4½′ N.		" 74° 31′ W.	

III.

1.	Latitude 39° 48′ N.		Longitude 73° 57′ W.	
2.	" 38° 48′ N.		" 74° 54′ W.	
3.	" 39° 4½′ N.		" 74° 31′ W.	

IV.

	Course to Steer	Distance Made Good Per Hour
1.	N.N.E. ½ E.	7 miles
2.	N.W.b.W. ¼ W.	14.4 "
3.	N.W.b.W. ¾ W.	9.5 "
4.	N.W. ½ N.	9.8 "
5.	E.b.N. ¾ N.	6.0 "

Keeping the Reckoning by the Chart.

1. Lat. 39° 12′ N. Long. 73° 54′ W. To the buoy W. ¾ N. 29 miles.

2. Lat. 39° 52′ N. Long. 73° 11′ W. Course and distance made good, N. E. ¾ E. 69 miles. To Barnegat; west 43½ miles.

3. Lat. 40° 12′ N. Long. 73° 15′ W. Course and distance made good, N. E. ¾ E. 69 miles. To Fire Island N. by E. ¾ E. 17 miles.

4. Lat. 39° 37′ N. Long. 73° 21′ W. To Absecon, W. S. W. 31 miles.

5. Lat. 40° 21′ N. Long. 73° 03′ W. To Montauk, N. E. by E. ½ E. 71 miles.

The activity along the water front marks the advent of another season.

Storage Battery Troubles and Remedies.

Some Important Facts About This Often Unjustly Accused Source of Current. A Few Precautions to be Observed That Will Insure its Good Behavior.

By C. Peterson.

PRACTICALLY every one who has used a lead plate battery has at sometime had it act "funny" and 'lay down," and usually through misinformation has blamed it all on the battery, threatening dire things, generally winding up with the determination to pitch the whole outfit overboard.

Now, in 99 cases out of 100, the battery is blameless, Mr. Man has given it a prolonged overdischarge and in so doing has caused an abnormal amount of lead sulphate, the storage battery White Plague, to be deposited.

The one remaining case in the hundred is caused by usual wear and tear over which one has no control.

Lead sulphate is a white insoluble substance absolutely without conductivity. It always forms in lead-sulphuric acid storage cells when on discharge and is reconverted to lead peroxide when on charge. Now, if we permit this sulphate to form in large patches through prolonged overdischarges, it is rather difficult and inconvenient, especially where the plant consists of only six cells, to bring the plates back to the original condition. In large installations, provision is made for cutting out individual cells in order to nurse them, as it were, but in the case of the average motor boat plant, if one cell goes out, the whole battery is to all intents and purposes, out, since it won't give satisfactory service where the ignition and lighting systems have been designed for six volts; we all know how quickly the lighting system shows a drop in the E. M. F.

A continued overdischarge will also cause severe internal strains in the plates, making them spring or buckle out of shape. This is due to the fact that if too much of the lead peroxide be converted to sulphate, the increase in volume sets up unequal strains. The result is either a short circuit between the plates or cracked and scaly ones. In this case the active material peels off the grid and falls to the bottom of the tank, where if permitted to accumulate, will cause short circuits by touching the bottom of the plates.

It must not be literally taken that sediment in storage batteries is directly and only caused by buckled plates. It only augments the sediment due to natural wear and tear.

Thin scaling or peeling reduces the active material of the cell and with it comes a corresponding shortening of the battery life, i. e., loss of capacity.

The lead plates are purposely made in their peculiar forms in order that as much of the active material (lead peroxide or sponge lead) may be exposed to the action of the electrolyte as possible and if the plates be covered with white insoluble, non-conducting patches, it is obvious that the charging current cannot go through them, but if only the ordinary amount is present, the high conductivity of the remaining exposed portion of the plate presents a good patch for the current and the change back to lead peroxide goes on, time being the controlling factor. It being understood that the charging current is constant.

The way then to keep out of battery trouble is to avoid discharge beyond 1.75-1.8 volts per cell. At any rate it is possible to reduce trouble to almost a negligible quantity, if we would:—

Charge until the electrolyte looks milky, the positive plates dark brown in color, the negatives gray, the reading gives a maximum of 2.4 to 2.7 volts per cell, and then stop. Charging beyond this means waste. Waste of energy, waste of acid through spraying and a rapid accumulation of sediment, not to say anything of the shortened life of the plates.

Keep the electrolyte free of impurities and at least ¼ inch above the plates, preferably ½ inch, and don't squirt acid into the cells each time the liquid looks low. Distilled water is all that is needed, and this only to replace the water lost through evaporation. Acid need be replenished only once a season in such a small outfit.

Contrary to the general impression, no meter will indicate how much remains in a battery after having been on discharge, since the meter cannot measure either the leakage which occurs before the current reaches the meter or the local action within the battery.

The only way to ascertain the value of the charge remaining is to measure the density of the electrolyte. This is infallible, because the fall in density is directly proportional to the ampere-hours taken out of the battery.

The Ways of Sound in Fog.

An Unreliable Guide in Any Weather, it Becomes Infinitely Worse During a Fog. Acoustic Clouds and How They Play Havoc With the Sounds of Gun and Siren.

By W. E. Partridge.

EVERY motor boatman is liable at some time to be caught out in a fog, and if he navigates his boat on open water where there is other traffic, he will probably encounter a number of problems, the solutions of which are not included in any text book. For his procedure, the proper signals and the courses to be pursued under various circumstances, he will find ample instruction in the laws, rules and regulations governing such cases. Fog, however, is not a thing whose various moods and peculiarities may be covered by instructions to fit each case, for it is continually presenting new and strange phenomena; it not only cuts off the vision as the inexperienced are likely to believe, but it also plays havoc with the action of sound, making it in some cases utterly unreliable.

Whenever there is a fog the numerous lighthouses along the coast start blowing the powerful sirens which which they are equipped. These are operated either by steam or compressed air supplied by powerful engines. Under normal conditions the sounds thus made can be heard for ten or twelve miles and even, under favorable conditions, as far as eighteen or twenty. Yet, in spite of this fact, scarcely a fog lifts without some captain reporting that at such and such a time a passed within a mile or a half mile of this or that light, during the fog, and that the siren was not blowing. Investigation has shown that in practically every case the signal was operating as usual. Thousands of cases of this kind having been reported, extensive investigations were set on foot, and the results proved what many had already concluded, that during a fog and in fact in clear weather, the action of sound is often most erratic and unreliable; for example, the sound of a whistle may not be heard by a listener half a mile away when persons at a much greater distance may hear it plainly. In some weather its sound may carry fifteen or sixteen miles, and again it may be inaudible at a distance of one or two miles. There seem to be "clouds," "acoustic clouds," one writer calls them, which prevent the sound from passing or deflect it. Instances of this kind may often be observed in clear weather. A steamer makes a signal with her whistle, we see the puff of steam, but although not far way, we hear no sound, and we usually say that the wind carries it away. The fact is that while the wind does have considerable effect, it is not as important a factor as we are likely to believe and the phenomenon is probably caused by one of the "clouds" just mentioned.

Different kinds of sound behave very differently. A high pitched steam whistle may be heard farther at times than one with a deep tone; at other times the latter may carry much farther. Sometimes a gun can be heard farther than a whistle, but there is no certainty in this case, for the same day and perhaps but a short time later the carrying power of the sound may be reversed. One case is recorded where neither guns, whistles nor sirens could be heard fifteen hundred feet away and yet the same sound on another day could plainly be heard at least twenty miles.

While such phenomena are confusing in clear weather, they are doubly so during the fog, as we have at such a time no way of determining how it is behaving.

There is another peculiarity even more confusing than that of the varying distance at which sound can be heard and this is its reflection. This is caused not only by solid bodies, such as the sails of vessels, shores or buildings, but from banks of clouds in the air which act like solid bodies in their power to reflect sound. The reflection is often much stronger than the sound heard directly. It is not an unusual thing that the direct sound is lost entirely and a startling echo is heard from an entirely different direction. Old sea captains, especially those who have had much experience in crowded waters, often say "a sound may come from anywhere."

Before a storm sounds seem to travel on the drift of the air and at such times sounds can be heard for many miles, which, under ordinary circumstances, can be heard but short distances.

These conditions should be kept in mind when one is caught in a fog. He must not think that because a sound is faint its source necessarily is far away, nor be certain that because a sound comes from the east it started from something to the eastward. In a word, sound is a most uncertain guide which becomes infinitely more so during fog and as at such times the navigator is practically deprived of his sense of sight, except for very short distances, he is compelled to rely upon soundings and dead reckoning to determine his course and position.

The Berger sub-surface torpedo boat made nearly 19 knots on her trial trip.

An Invulnerable Torpedo Boat.

The Berger Sub-Surface Torpedo Boat Which Promises a Revolution in the Design of Smaller War Craft. A Little Boat That Defies The Fire of Battleships.

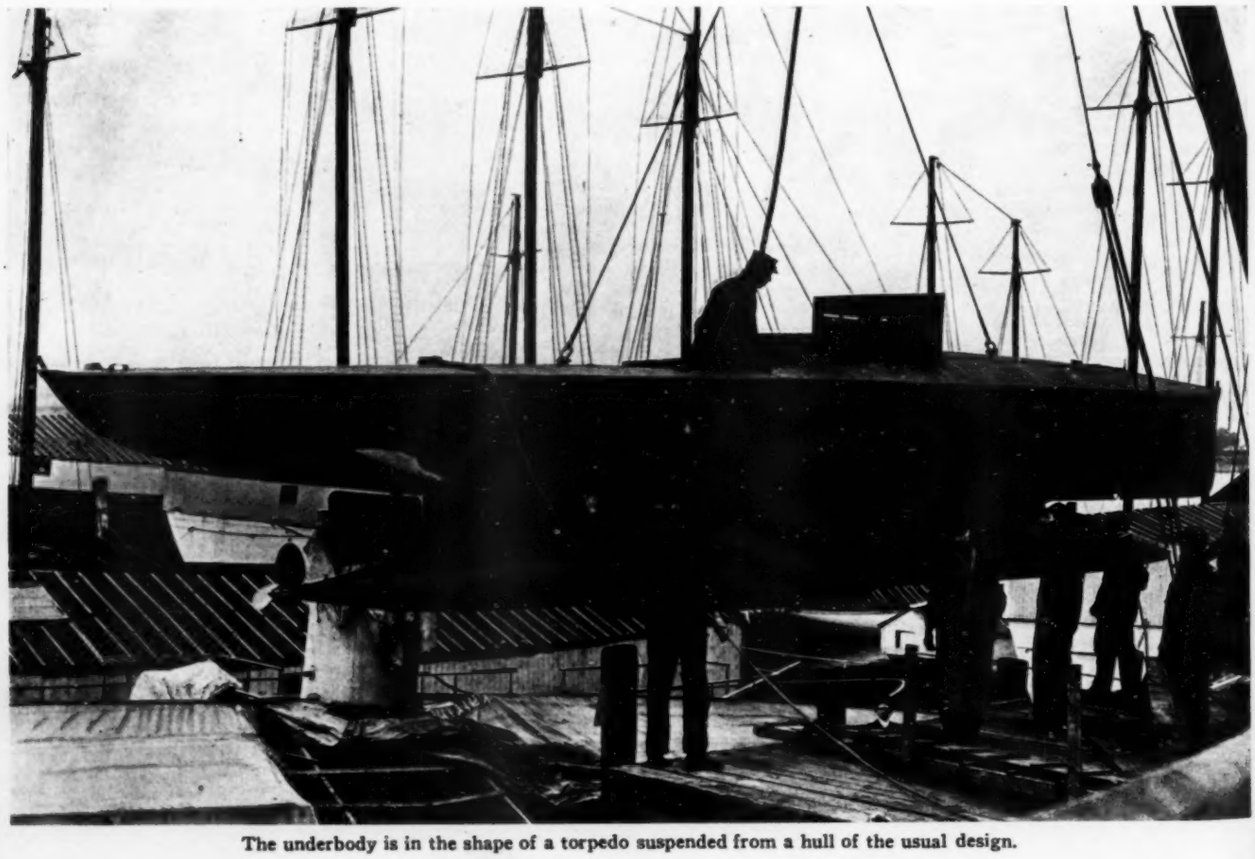
(Photographs Copyright by H. B. Greene).

A CRAFT of unique design that promises greatly to influence the construction of our future torpedo boats has recently been completed at the yards of Geo. F. Lawley & Son, and is soon to be tested by the United States Government. The boat is the result of several years spent in experiments by her inventor, Mr. Charles L. Berger, whose ideas were incorporated into the final design by Messrs. Tams, Lemoine and Crane, of New York City.

Briefly, the new craft consists of a steel hull not greatly unlike that of the ordinary torpedo boat, to which is suspended a fin in the form of a torpedo, which contains the motor. The upper hull is lightly constructed in several compartments with are filled with cellulose, and as all the vital parts are placed in the sub-surface hull, the upper part may be riddled with shot without at all affecting the efficiency of the boat. Even if all the compartments were pierced the cellulose would prevent the boat from becoming waterlogged.

With the center of gravity located well below the surface of the water it is claimed that it is infinitely more seaworthy than craft of the ordinary design, which quality, together with its invulnerability, low initial cost and running expense, should determine its acceptance by the government.

The length of the boat shown in the accompanying illustrations, which is merely a fore-runner of larger and more powerful craft of similar design, is 45 feet 9 inches, with draft of 3 feet 9 inches and beam of 5 feet 4 inches, and her displacement is approximately 6 tons. Her power plant is an 8 cylinder Jencick motor, developing 150 horsepower, and this equipment gives the boat a speed of approximately 20 knots, showing that the peculiar construction of her under-body does not materially affect her speed. Her



The underbody is in the shape of a torpedo suspended from a hull of the usual design.

Due to her low center of gravity her stability and seaworthiness are much greater than in a boat of ordinary design.

cruising radius at full speed is 100 miles and on half speed about double that distance.

The cost of this boat, the first of its kind to be built, was $22,500, which will permit of several being built for the cost of one much more complicated and fragile torpedo boat; but two men are needed to operate the boat, a steersman and engineer, so that the running expense is also much less than that of the present boats.

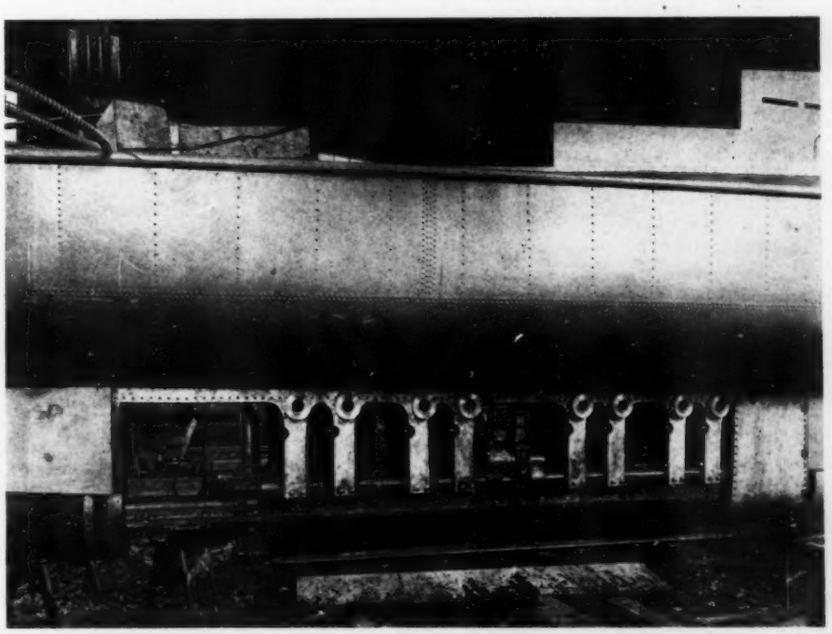
It was Mr. Berger's idea in planning the sub-surface torpedo boat to produce a craft that would combine the invulnerability of the submarine with all the more desirable features of the existing type of torpedo boat, but with none of the fragility of the latter which may be put out of commission by one well-directed shot. As the vital parts are below the surface they are effectually protected from the fire of anything but the largest guns, leaving the operator's cockpit the only vulnerable spot. In a naval engagement the boat would be run at full speed toward one of the enemy's ships, and when near enough to ensure its hitting the mark the helm would be lashed and the crew would take to the life buoys. The forward part of the cigar-shaped underbody would be packed with gun cotton or other explosive in sufficient quantity to produce, on coming in contact with the vessel's side, an explosion much more powerful than that of the ordinary torpedo, and no vessel could stop the simultaneous attack of a number of such boats directed from different points.

For the cost of two or three destroyers or submarines a whole fleet of these little boats could be constructed and placed in the Philippine, Panama and along the Pacific coast, all of which points are ineffectually protected in the absence of our fleets. Due to their small size and weight they could be carried easily aboard battleships or transports or could be carried overland to be launched in time of action or to be distributed to the points where they were needed.

On March 4th a short preliminary trial was made in Boston Harbor. The boat behaved perfectly, responding as readily to her helm as the ordinary type of boat and showing a speed of better than 18 knots, and it was the opinion of those who witnessed her performance that she thoroughly justified the hopes of her designers.

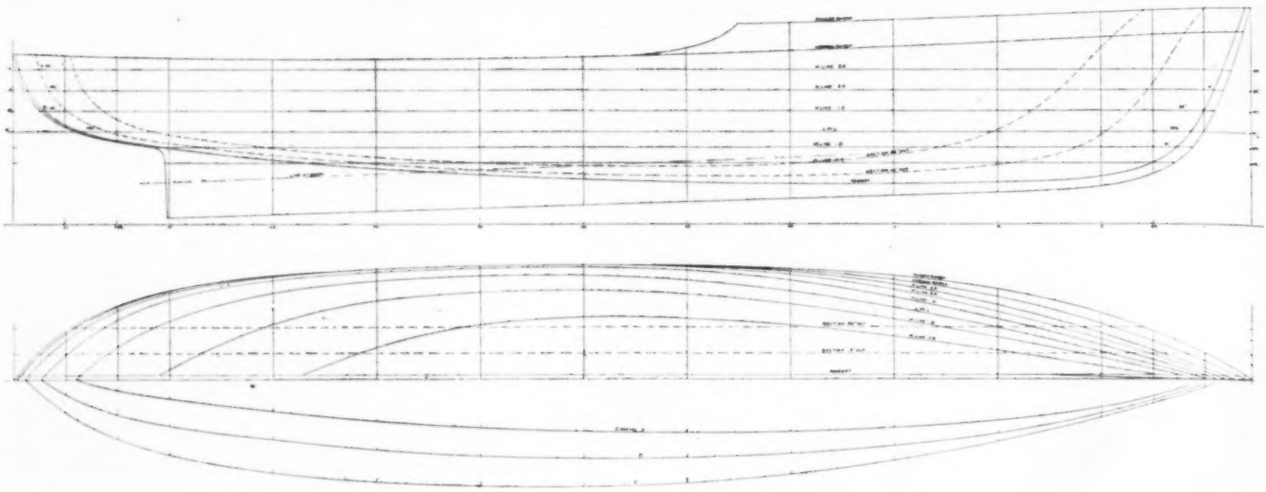
Mr. Berger, the designer of the Berger sub-surface torpedo boat, was graduated from Princeton in 1885. For some time after graduation he was interested in civil engineering, but later studied law, becoming a patent attorney. In this capacity he had occasion to observe the progress of naval design, in which he had always been greatly interested, and shortly after the Spanish-American War, during which he had seen the weak points of the torpedo boats then in use, he started experimenting along this line, and after formulating his ideas he turned them over to Messrs. Tams, Lemoine and Crane, who put them into execution, as shown in the accompanying illustrations.

When afloat the boat is to all appearances of the torpedo boat type, but somewhat shorter. Nothing appears above the deck but the armored shield about the cockpit. Nothing about the plain exterior of her upper body intimates that she is anything but a speed boat of similar design to many another, excepting her stern, which is of the compromise type.



The side plates removed showing the 8-cylinder Jencick motor in the fin.

New Motor Boat Designs.



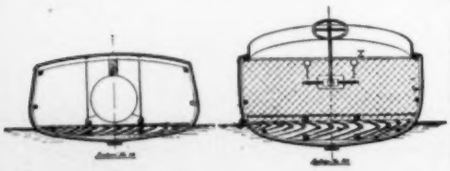
Lines of the 60-foot cruiser Madegare II, showing the symmetry of her design fore and aft.

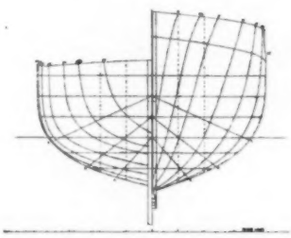
Madegare II. 60-Foot Cruiser.

THE plans illustrated herewith show the new power boat Madegare II, which was designed and built by Frederick S. Nock, of East Greenwich, R. I., for Mr. E. P. Lawson, of New York City.

The general dimension of the boat are as follows: Length over all, 60 feet; length waterline, 54 feet; breadth, extreme, 11 feet; draft, 4 feet 3 inches; head room, clear of beams, 6 feet 6 inches. The lines of the boat are fine but little effort has been made towards lightening her in order to obtain speed, as can readily be discerned from the fact that the keel, stem, and stern crook are sided 5 inches and the shaft-log 7 inches. The frames are steam bent white oak, 1¾ inches square, spaced 10 inches. Bilge and deck clamps are of yellow pine 1½ x 5 inches, tapered at ends. The yellow pine keelson is 3 x 6 inches, with sister keelsons of oak, sided 5 inches, which are used as fore and aft bearers to engine bed. Double watertight bulkheads aft of engine room and main cabin materially help to strengthen the hull. The deck frame is amply reinforced with oak quarter knees. The deck planks are 1¼ inch thick.

The raised deck forward is 17 feet in length; the bridge deck 5 feet. The cabin trunk 27 feet long, the sides of the raised deck are continued in the form of bulwarks well aft of the forward end of the cabin trunk, thus





affording protection to the side windows toward the forward end of the trunk.

In the forepeak there is a large chain locker, next the crew's toilet and then the crew's quarters and engine room with transom seat, pipe berths, clothes lockers, etc. Under the after end of the bridge deck is situated the air tank for whistle, also the water tanks.

The power plant is a 4-cylinder 20th Century engine, 6½ inch bore, 8½ inch stroke with double system of ignition, using their regular make-and-break and the Bosch magnetic plugs. Provision is also made under the bridge deck for the electric lighting plant with switchboard, generator, etc.

Situated at the forward end of the trunk is the galley, 4 feet fore and aft and the entire width of the boat. A large refrigerator, provision locker, four-hole Shipmate range, sink, dish lockers, dresser, lockers for the storage of cooking utensils, etc., complete the arrangement of the galley.

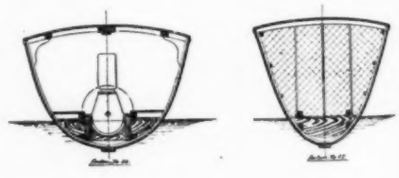
Aft of the galley is a saloon 9 feet in length; at the forward end there are two sideboards and buffets, with leaded glass doors. The extension berths are of ample dimensions and afford sleeping accommodations for four persons when extended. Back of the berths there is considerable locker space and below the berths on either side are three drawers. A large extension table admits of dining a number of persons comfortably.

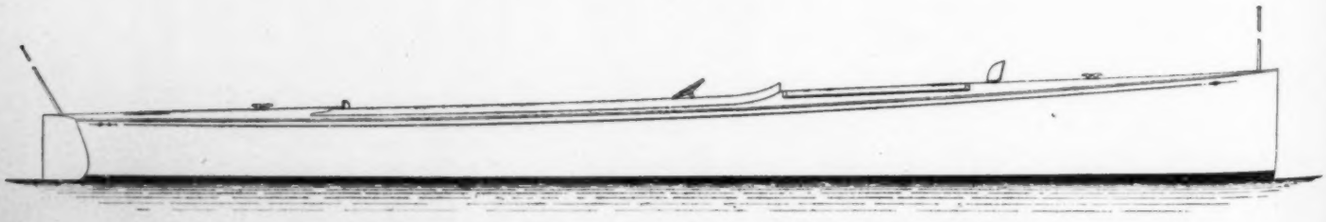
Passing aft from the saloon one enters a passageway on the port side of which is the guest's state-room with single berth, full length wardrobe, bureau, etc. On the opposite side is the bathroom with complete equipment. Next aft on the same side is the companionway, and directly opposite same a large clothes press. Aft of these is the owner's state-room, 7 feet long and the width of the boat, with a double berth, bureau, desk, etc., and ample lockers for the storage of clothing, bed and table linen. Under the after deck is situated the copper gasoline tank and storage batteries.

A 40-Foot Speed Launch.

THE accompanying profile and sections are of a speed launch which is being built for Mr. M. B. Salisbury for use at Bar Harbor and for racing at other points along the Maine coast. The boat was designed by Mr. Henry J. Gielow and her dimensions are as follows: Length over all, 39 feet 11 inches; beam, 5 feet 6 inches and draft 10 inches. Her waterline is fairly full, running in an unbroken line from the forefoot to the stern and the lines show no hollows in any part of the model.

The motor is a six cylinder, high speed Lamb, capable of developing 75 horsepower.

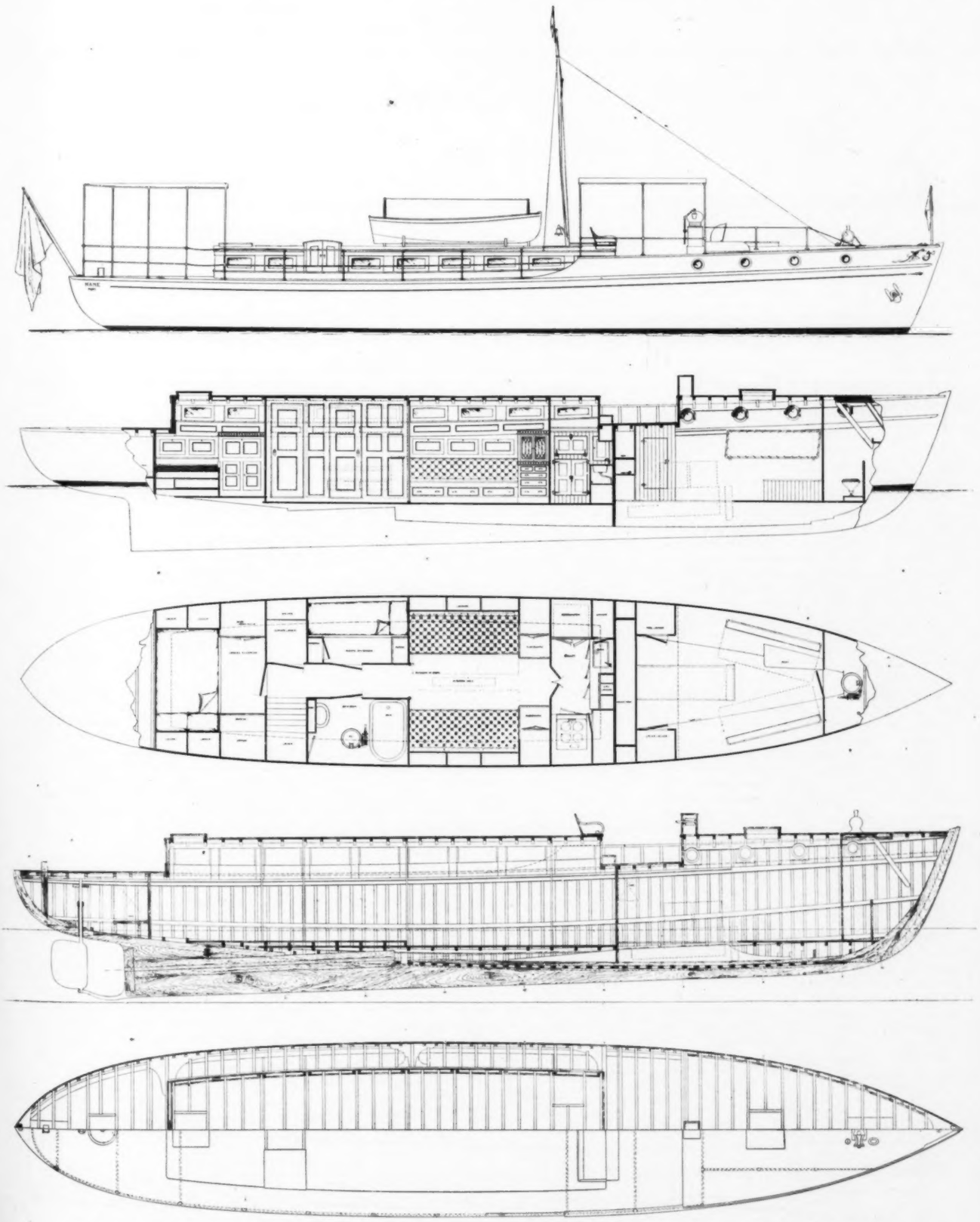




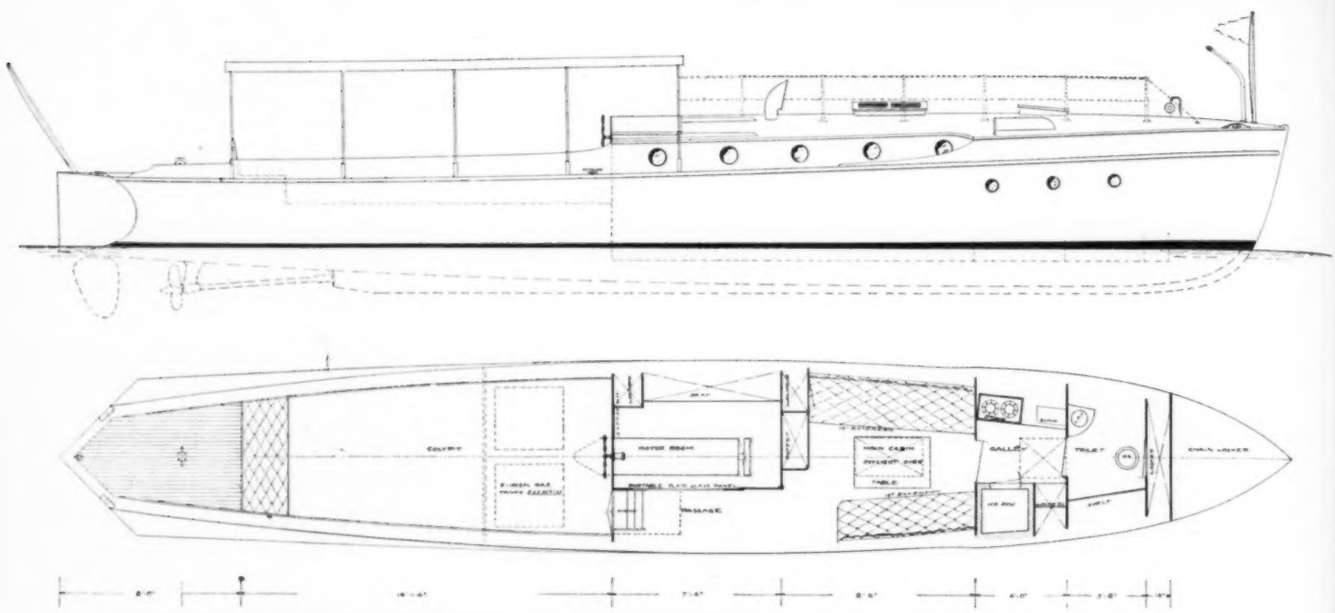
Profile and sections of the 40-foot speed launch designed by Henry J. Gielow.

It is exceptionally light, the crankcase, intake and exhaust manifolds being of aluminum alloy. The valves are in the head and directly over the pistons, but otherwise the motor shows the same general characteristics as the medium duty Lamb, with the individual cylinders, removable cylinder heads and the water jacketed exhaust muffler.

The scantlings throughout the boat are substantial though light; her stem, keel and stern post are of white oak and the oak frames are spaced six inches between centers, being made somewhat larger amidships and tapering gradually to the ends. She is double planked throughout with mahogany and cedar, with silk between the two layers. The decks are constructed the same as the sides of the boat. The foundations of the motor are longitudinal trusses of Oregon pine, extending practically the full length of the boat, and there are a number of transverse stiffeners which add to the rigidity. A speed of 25 miles is guaranteed. Below are shown the outboard profile and sections of this boat.



Outboard profile, accommodation and construction plans of Madegare II, the 60-footer designed by Frederick S. Nock, of East Greenwich, Rhode Island.



Speejacks, the 54-foot express launch, will have a speed of over 18 miles per hour.

Express Launch Speejacks.

THE Matthews Boat Company, of Port Clinton, Ohio, are building a 54 foot, high speed express launch for Mr. A. Y. Gowen, of Cleveland, Ohio. The boat is built for a definite express service; that is, a trip three times a week is required between Kelleys Island and Cleveland, a distance of 60 miles. It is absolutely essential that the boat be made to stand extreme rough weather conditions, and a cruising speed of 16 miles per hour be maintained. The builders have guaranteed a maximum speed of 18 miles per hour, and from past performances expect a speed of 19 to 21 miles per hour.

The accompanying plans give a very good idea of the profile and interior arrangement of the boat. The general dimensions are: Length over all 54 feet 4 inches; beam, 8 feet 6 inches; draft 3 feet.

The construction provides for an oak strap-keel in single length, rabbetted to receive planking, and fitted with outside deadwood, as shown. Frames are of young-growth oak, continuous from gunwale to gunwale, and closely spaced. Stringers are of long-leaf yellow pine, riveted through frame-heads. A special truss is arranged under the after cockpit floor to take up vibration and give the maximum strength. The engine bearers are made about 16 feet in length to spread the vibration over a large area, and make the boat comfortable when driven under full power.

The planking is of cedar, and the cabin is finished inside and out with select Tobasco mahogany..

There is a water-tight bulkhead immediately aft of the chain locker, another under cockpit floor, and a third under the after deck just aft of the divan seat.

The galley is equipped with a 2-hole alcohol stove, sink, large ice-box, dish racks, and lockers, and a box-hatch is placed over for emergency exit, light and ventilation.

The main cabin is equipped with two extension berths, and a full-length locker and ornamental buffet aft. A folding table is placed between the berths to conform to the space between. Light and ventilation are secured by sixteen 8-inch hinged brass port lights, and the skylight over the cabin.

The motor is located in an entirely separate compartment, and entrance to same is gained through door from passageway. The bulkhead alongside of passageway is built to receive a plate-glass panel so that the motor may be seen in operation from the passageway, and good light obtained in the compartment. A second window hinging outward is arranged on the after bulkhead.

The motor is thoroughly accessible in all its parts, and all controls are brought alongside the steering wheel on after bulkhead. The gasoline supply is located under the cockpit floor in a water-tight compartment, and arranged for gravity feed. The tanks are built of heavy rolled copper, having a combined capacity of 200 gallons, and are placed in sub-tanks having drain outboard.

The cockpit aft is of the self-bailing type, with white pine deck-laid floor. Weather protection is afforded by a pipe-frame awning covered with "khaki" duck, with side curtains of the same material.

A double pipe railing is arranged from cockpit to forward portion of deck, with portable teakwood treadway between rails to give security when handling the ground tackle.

The power equipment consists of a 6-cylinder, 6¼ x 8 inch special high speed Speedway motor, equipped with a Bosch low tension magneto, and separate Hercules ignition outfit. The rating of the motor is 125 h.p., although more power may be expected from the plant.

The boat will be lighted by an independent lighting plant, consisting of a 2-cylinder Buffalo motor directly connected to generator, with lights operating under 110-V. circuit.

This will be one of the fastest cabin motor boats on the Great Lakes, and it can be said that it will be the forerunner of a number of craft of the same type.

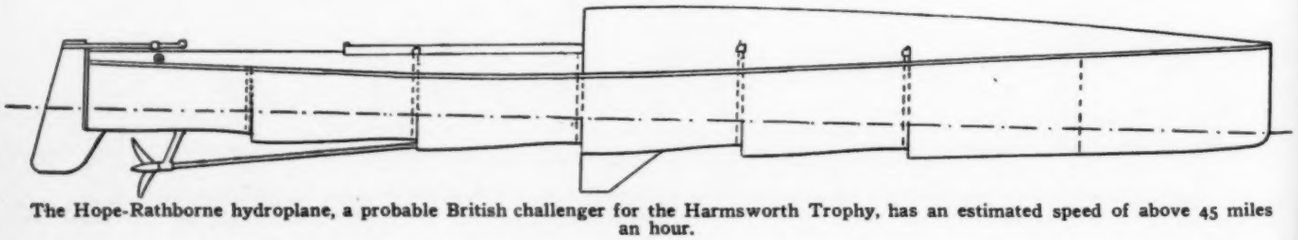
41-Foot Bridge Deck Cruiser.

THE accompanying plans are by W. J. Deed, Jr., of Boston, and are for a boat with more deck room than is usually provided in a boat of this size. She is to be 41 feet over all, with 9 feet 6 inches of beam and draft of 3 feet. A 20 h.p. Buffalo motor will propel her at the rate of 9 knots an hour.

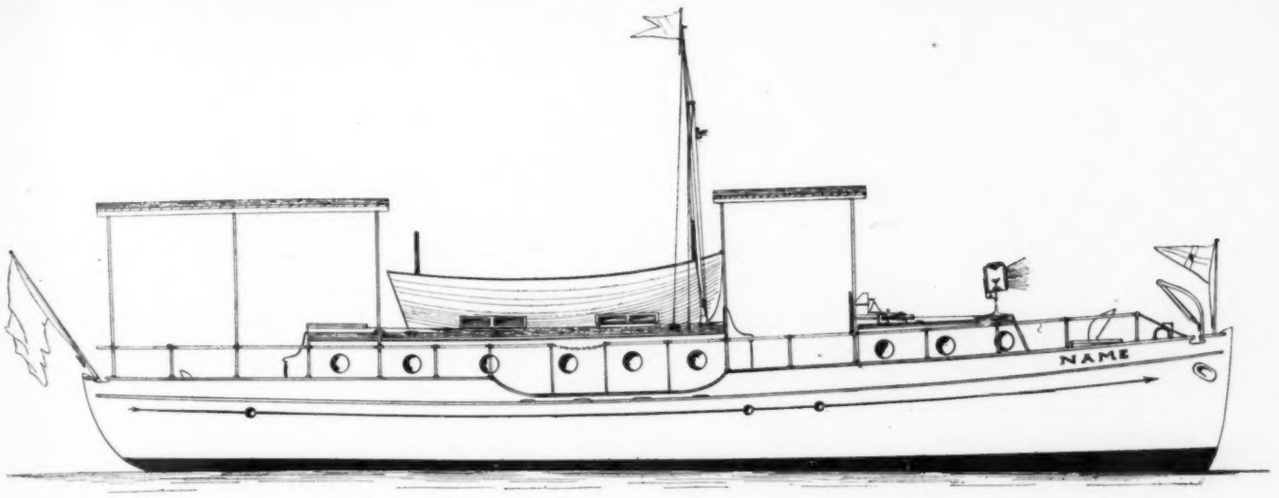
Two interior arrangements are shown for this boat and a comparison is interesting. The upper plan shows plenty of elbow room for a limited number with a good layout for saloon and owner's state-room with toilet room between. By a convenient arrangement of curtains the saloon may be made into two state-rooms with independent access to the toilet room. In this layout the forecastle and galley together with several lockers are located forward of the engine room, which is beneath the bridge deck.

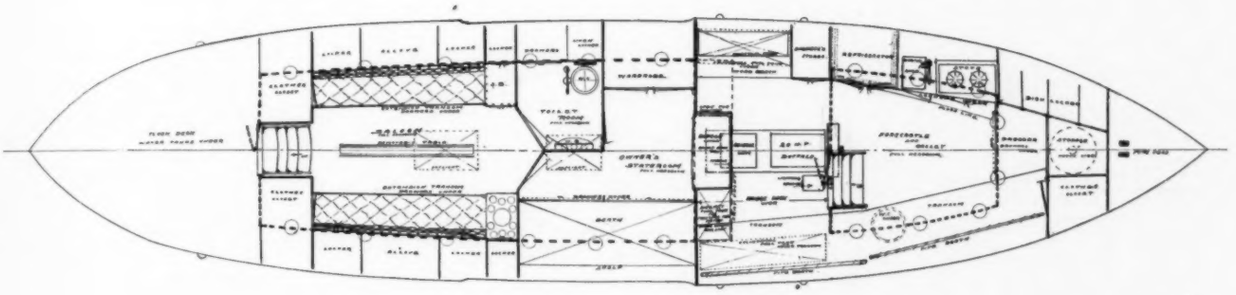
In the lower plan the arrangement includes two state-rooms in addition to the usual features. The engine room remains beneath the bridge deck, but the other arrangement is entirely different. Forward of the engine room is a small forecastle and vestibule with companionway, and in the bow there is a state-room. The galley and toilet room occupy equal spaces on either side of the boat just aft of the engine room, and next comes the main saloon on either side of which are transom berths. Another state-room is provided for just aft the saloon on the port side, and it will be seen that every bit of the available space has been well utilized.

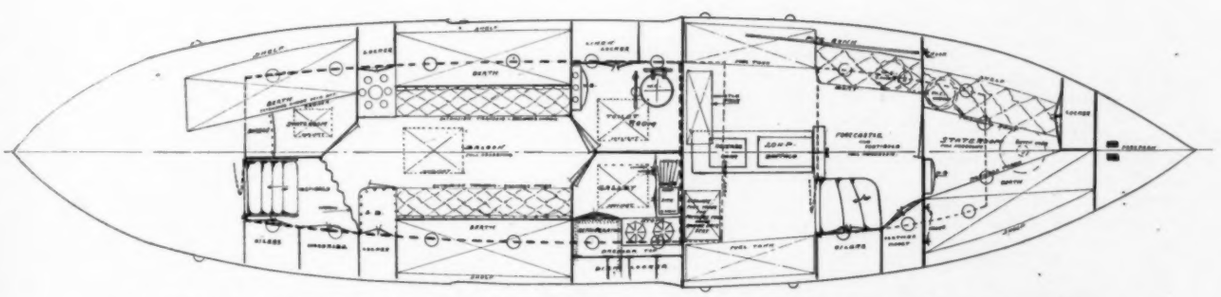
The deck plans of the two arrangements are practically alike. There is a small trunk forward, aft of which comes the bridge deck with a seat along the forward end of the cabin trunk. This trunk, which is provided with port lights and skylights instead of windows, extends aft with a clear passage on either side, and there is another seat across the after end. Both the bridge deck and the after deck are protected by canopy tops, and there is room for several chairs at both places.



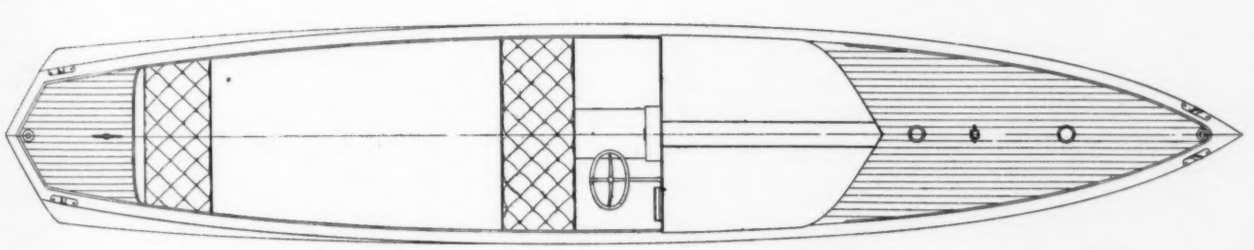
The Hope-Rathborne hydroplane, a probable British challenger for the Harmsworth Trophy, has an estimated speed of above 45 miles an hour.

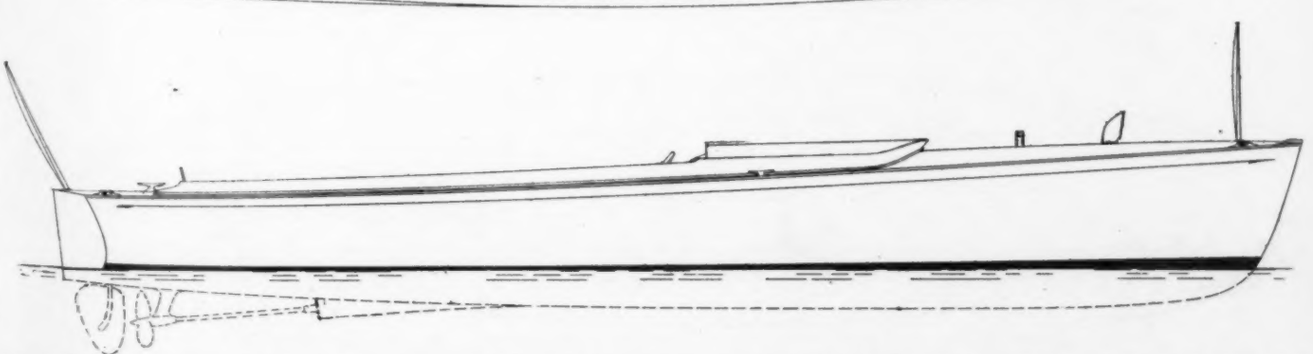




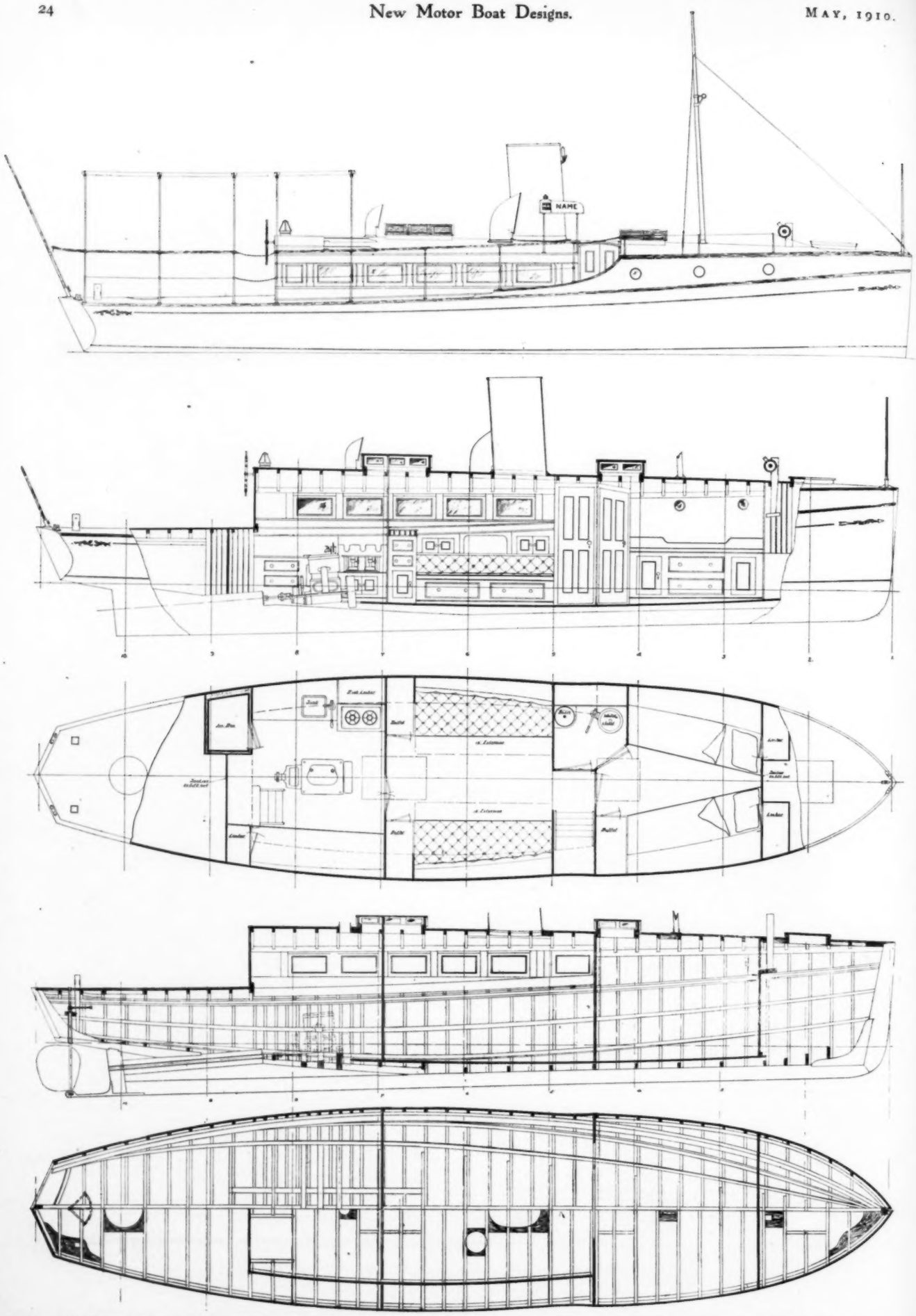


The 41-foot Bridge-Deck Cruiser designed by William J. Deed, Jr., showing two interior arrangements.

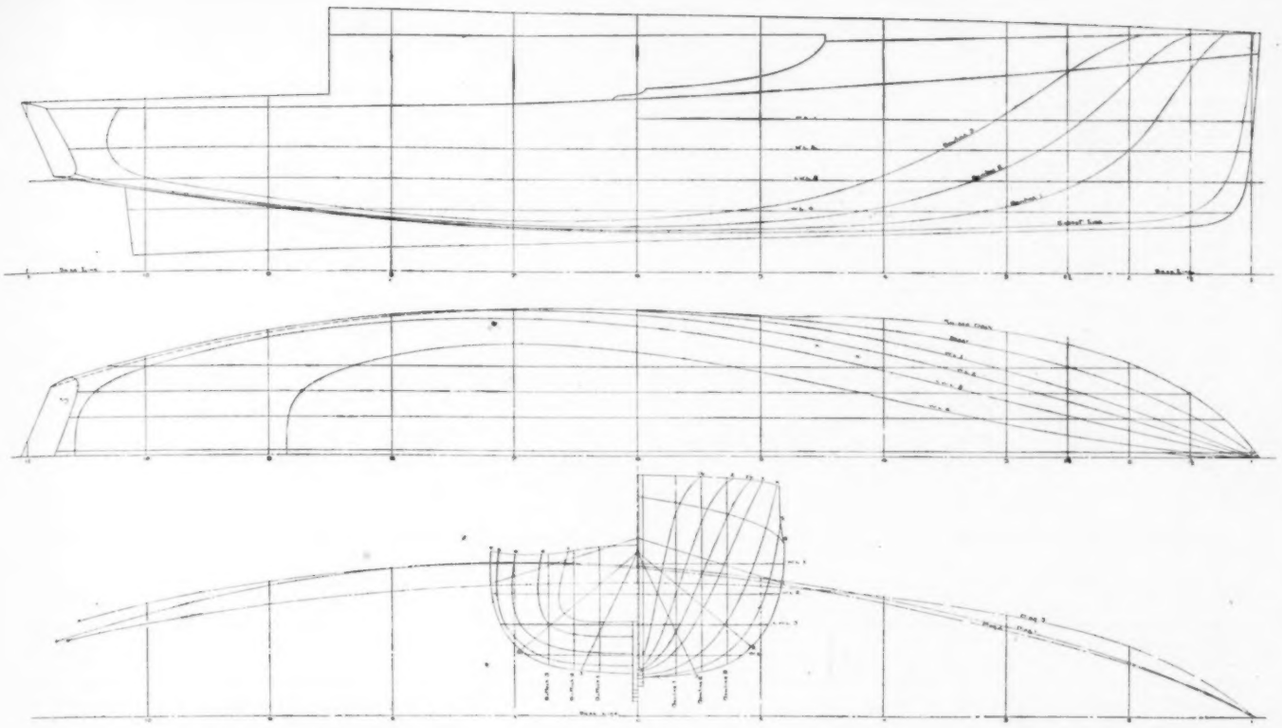




A 30-foot runabout equipped with a 35 horse power Jager motor, built by the Matthews Boat Company for Mr. Harvey Bates of Indianapolis.



Outboard profile, accommodation and construction plans of the trim 41-foot cruiser designed by Messrs. Bowes and Watts.



The lines of the 41-foot cruiser show considerable flare at the bow, sharp entrance, and easy run.

A 41-Foot Cruiser.

THE complete design shown herewith is of a forty foot cruising motor boat, designed by Bowes & Watts, of Philadelphia, for Mr. George V. Dotterer, of Atlantic City, and which will sail under the colors of the Ventnor Motor Boat Club.

The arrangement of the boat will be similar to that of the Barnegat Bay Cruiser, designed by a member of this firm some years ago. The boats built to this design were very successful, and their influence is shown in many boats all over the country.

This boat will be 40 feet over all, 9 feet 6 inches in breadth, and of 30 inches draft, and will be used both on the inside waters of the Jersey coast, and for trips up and down the coast.

The state-room and toilet room are adjoining and are apart from the other accommodations; they are in the extreme forward part of the boat. A companionway was placed on the starboard side opposite the toilet room so that whoever occupies the forward state-room may go on deck without going through the cabin.

The frames are of white oak, planking of yellow pine, and interior finish in white enamel with mahogany trim.

A companionway opens on this deck from the engine room, so that the engine can be easily reached and the supplies taken below to the galley, which is on the port side. On the starboard side of the engine room there is a berth for the paid hand.

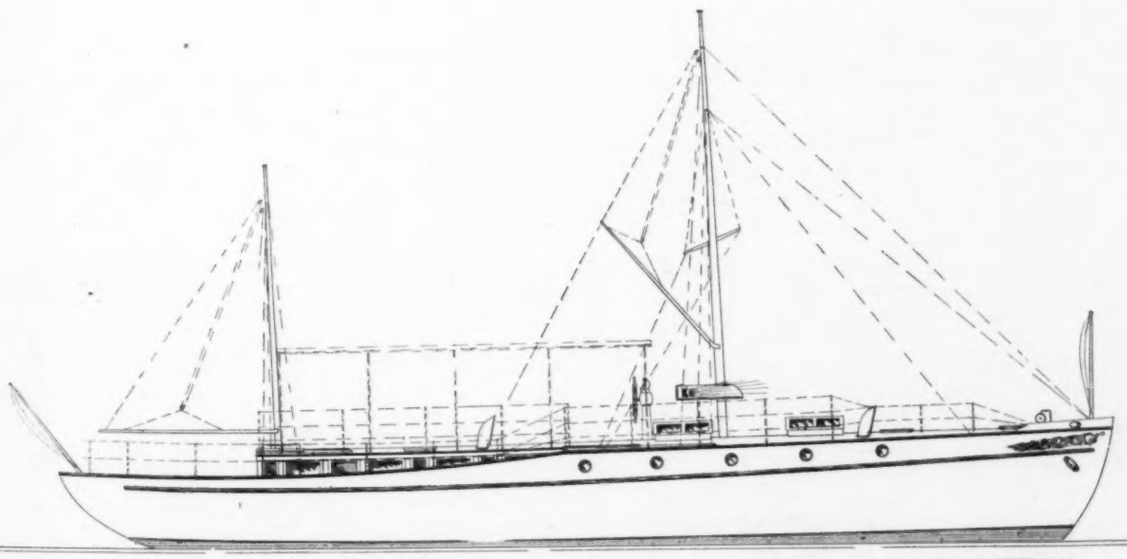
The boat will be completely equipped with electric lights and everything that can add to the comfort of those on board will be included in her equipment. The engine will be supplied by the Hall Gas Engine Company, of Philadelphia, and the hull is being built by the Sharptown Yacht Building Company, of Maryland.

55-Foot Heavy Weather Cruiser.

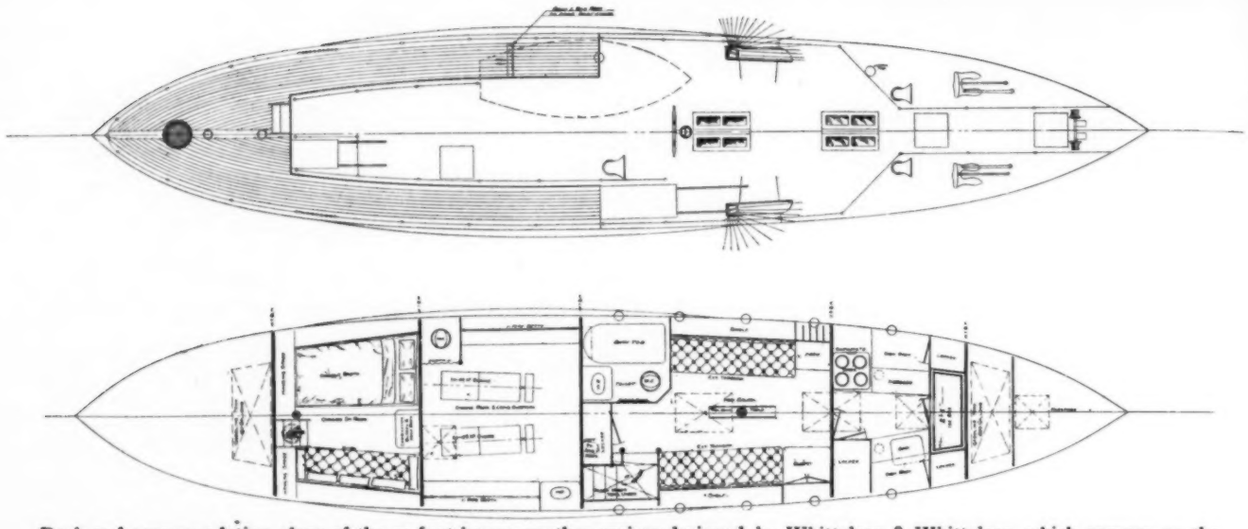
DESIGNS for a 55 ft. cruising motor yacht have just been completed by Whittelsey & Whittelsey, of New York, for Mr. J. K. L. Ross, of Sydney, N. S. This cruiser represents the deep sea type developed by this firm last year.

The boat has a flaring bow developing into a sharp, deep section amidships with a maximum draft of 4 feet 2 inches. Ballast will be carried on the keel and also inboard. The construction is very heavy, the framing being double throughout the engine space with six pairs of longitudinals extending the full length of the hull. The propeller will work above the keel line to avoid danger of grounding, but, owing to the deep draft, they will not be in danger of racing.

An auxiliary sail rig will be supplied with



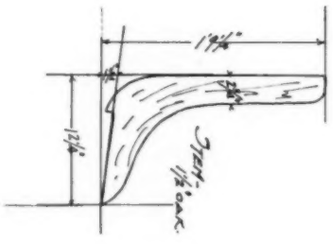
The 55-footer designed by Messrs. Whittlesey for Mr. J. K. L. Ross, of Sydney, N. S., is a probable entrant for the Bermuda Race.



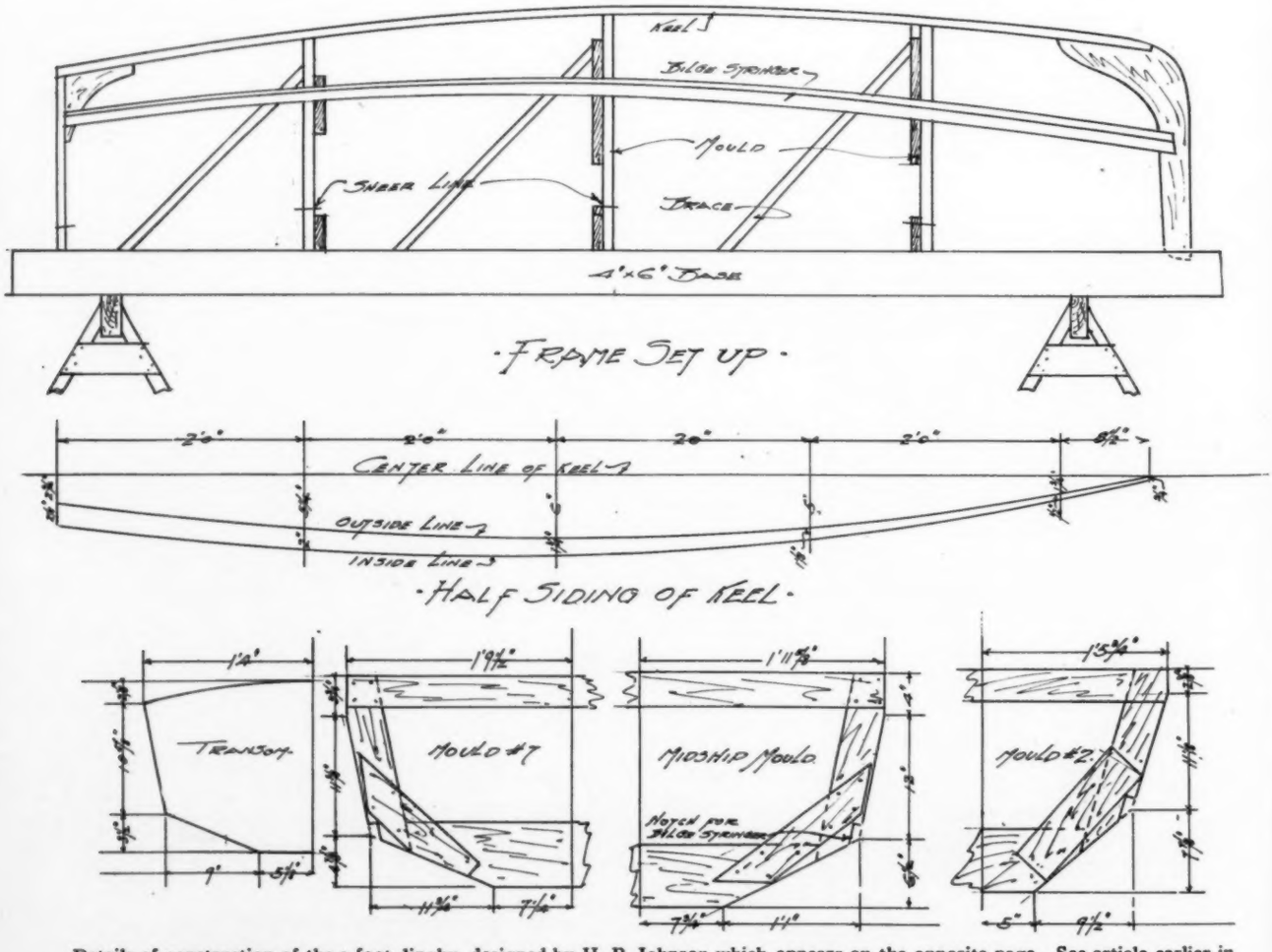
Deck and accommodation plans of the 55-foot heavy weather cruiser designed by Whittelsey & Whittelsey, which appears on the preceding page.

which the boat will be able to make headway without the engine. She will be subject to the heaviest kind of weather off Nova Scotia and will be equipped especially with the idea of withstanding the stormy weather conditions which are found off this coast.

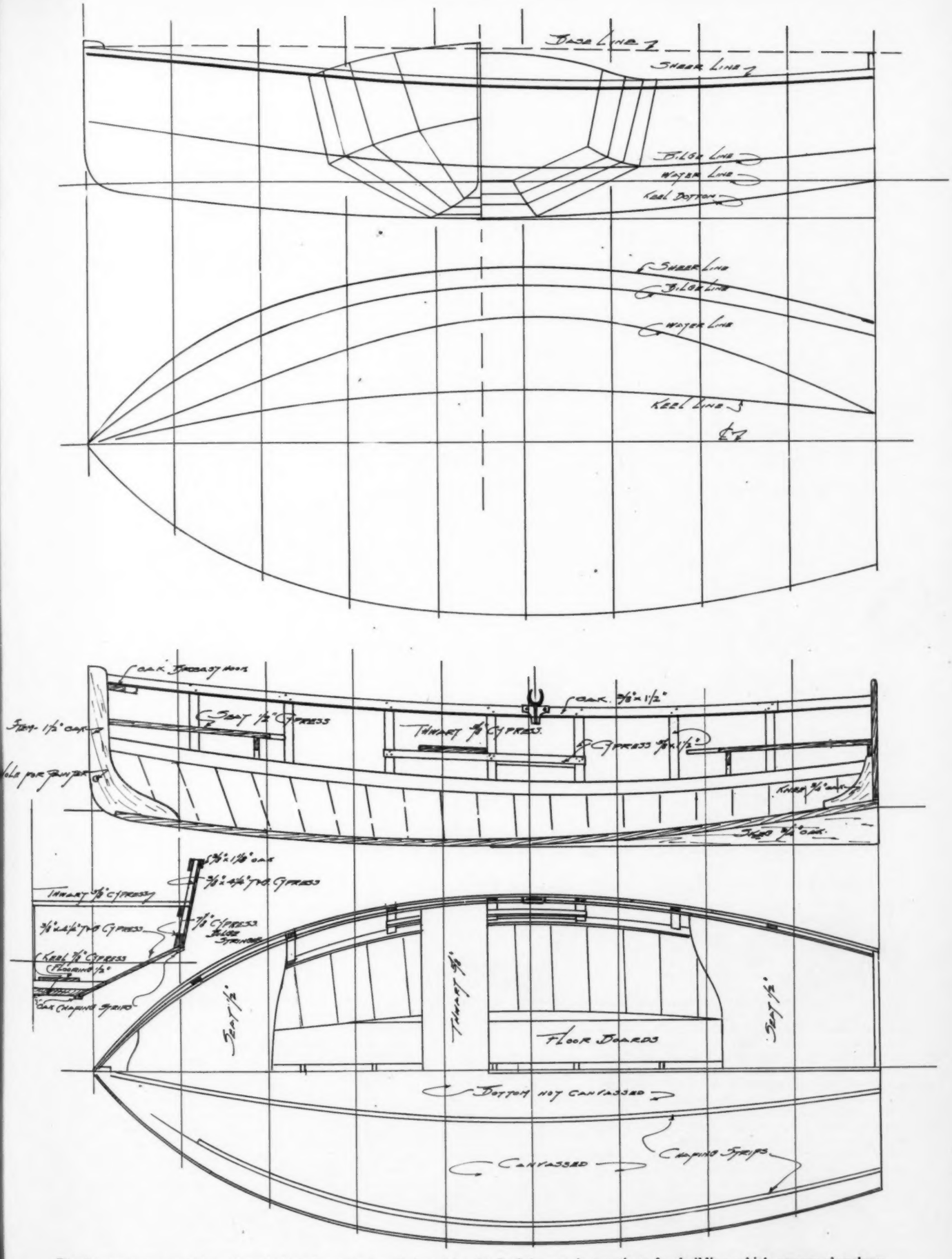
The interior layout provides for a roomy galley forward, abaft of which is the saloon, containing two extension berths with pipe berths swung above, giving sleeping accommodations for four. Adjoining this saloon is a bathroom fitted with tub and toilet fixtures. The engine room is located about amidships and has adjoining crew's toilet, wash basin and two pipe berths. The owner's state-room is located aft.



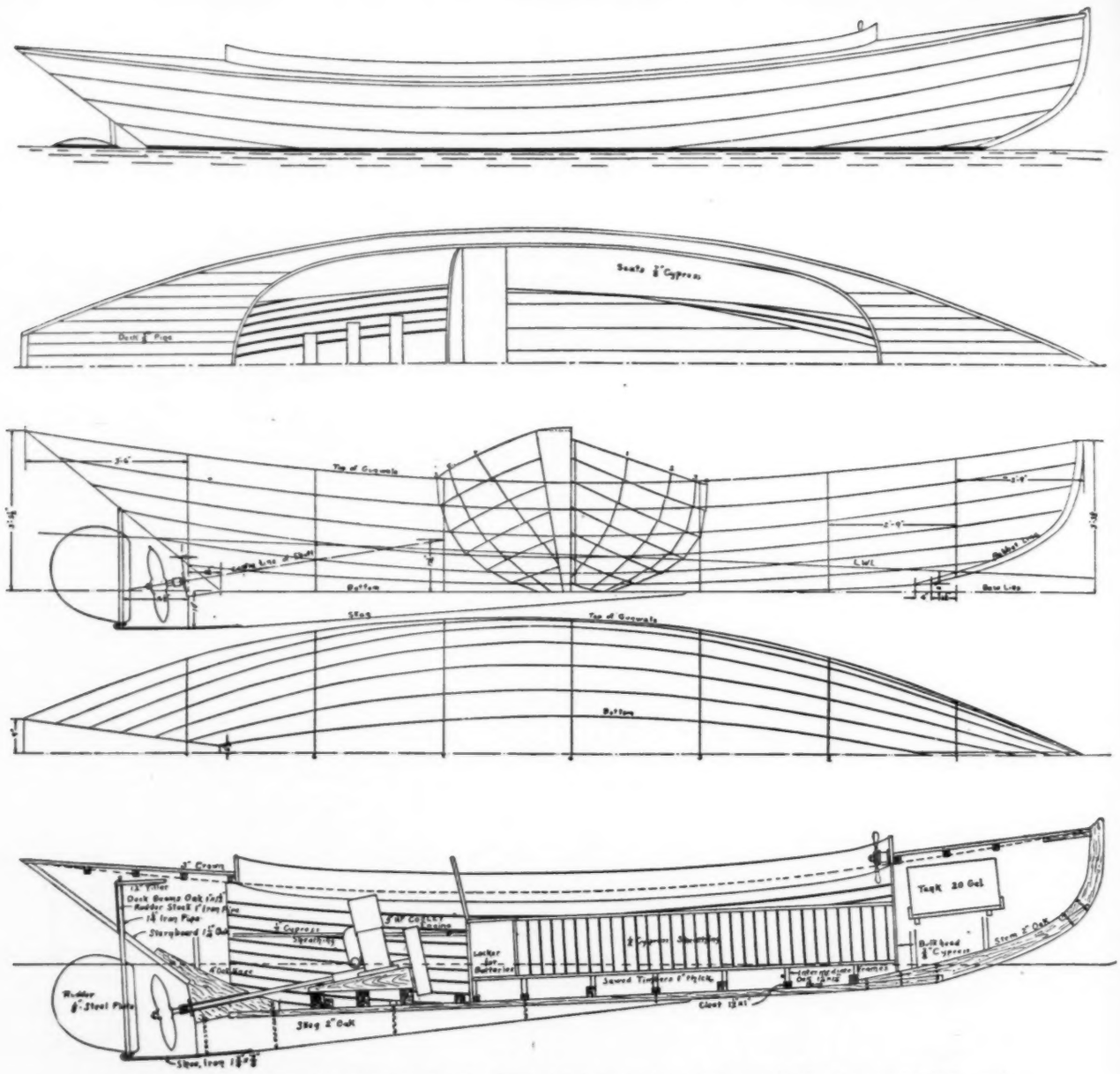
The gasoline tanks are installed in accordance with that system preferred and recommended by the Board of Fire Underwriters. This system provides for a complete water jacketing of the tanks, which practically eliminates all danger from explosion or fire. The boat has four water-tight bulkheads and they will drain by sluice valves to the power bilge draining system. The power installed will be two 30-45 heavy duty Sterling engines which will be controlled from the wheel located on the main deck nearly amidships.



Details of construction of the 9-foot dinghy, designed by H. P. Johnson which appears on the opposite page. See article earlier in this issue.



The lines and construction plan of the 9-foot dinghy, designed by H. P. Johnson, instructions for building which appear elsewhere in this issue.

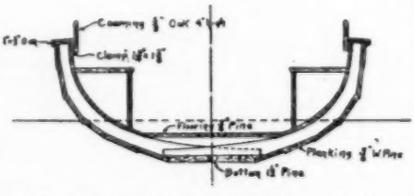


The Cooley 22-foot Cape Ann power dory with 5 horse power motor is a good combination for any kind of weather.

Cape Ann Power Dory.

THE above design is of the Cape Ann Power Dory built by the Cooley Manufacturing Company. This type of boat is used extensively by fishermen and others along the coast and is built to a design that has proved itself capable of withstanding the hardest kind of usage in all kinds of weather. Its ample depth, raking bow and stern and flaring sides all contribute to its seaworthiness, and as it is reasonably fast it is an ideal boat for all-around service. This boat is designed to carry ten to twelve people safely and, equipped with a five horse power motor especially designed for her by the same firm, she is good for nine miles per hour.

She is twenty-two feet nine inches over all and fifteen feet on the bottom. The extreme beam is six feet and the depth amidships is two feet four inches. The timbers, stem, transom and skeg, are all of oak and of liberal dimensions. The planking is of ⅝ inch pine and there are six strakes on a side, lapped ⅞ of an inch and nailed every two inches with galvanized lap nails, clinched. The decks are of ⅝ inch pine laid in narrow strips. The coaming is of oak, ⅝ of an inch in thickness, and extends five inches above the deck. The interior finish is of cypress throughout.



The outside of the hull is painted with three coats of yacht white above the water line and with two coats of green copper paint below the waterline. The inside of hull is painted two coats of lead paint before being sheathed. Decks, coamings and interior are finished bright.

New Design for a 70-Footer.

THE Bridgeport Motor Co. have recently completed a design for a boat whose dimensions are as follows: Length over all, 70 ft.; waterline length, 67 ft.; extreme beam, 14 ft.; least freeboard, 3½ ft.; extreme freeboard forward, 6½ ft. The head room throughout the various cabins is 6 ft. 3 in.

The engine room is located amidships and occupies the full width of the boat, and is 8 ft. in length. A berth is provided on either side, and companionway stairs lead to the bridge deck. Under the companionway stairs is located the crew's toilet.

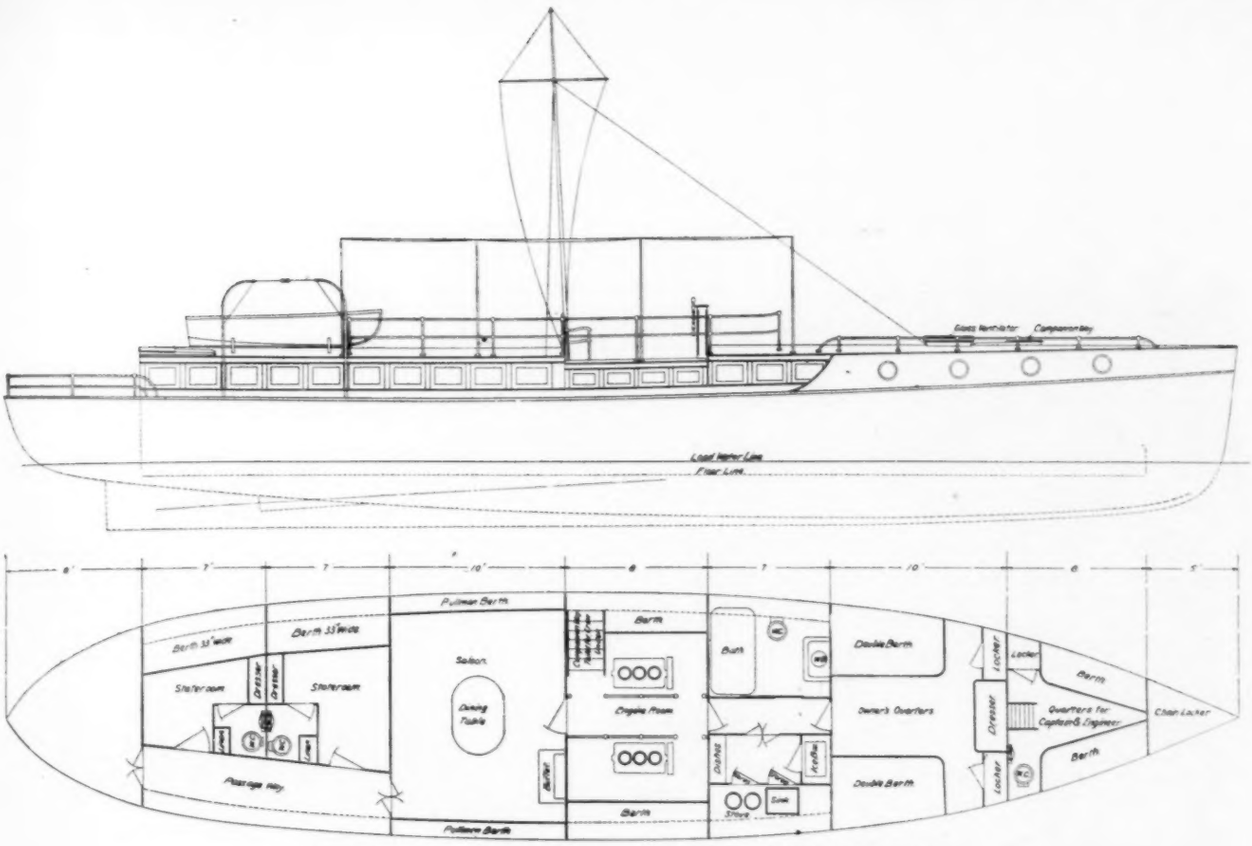
The design calls for twin-screws, and the boat is capable of handling from 50 to 300 h.p., according to the speed required, which has not as yet been specified.

28-Foot Cruiser.

THE design here shown is from the board of W. J. Deed, Jr., of Boston, and shows an interesting interior arrangement. The boat is 28 feet over all with a breadth of 7 feet 6 inches and draft of 2 feet 9 inches. The freeboard forward is 4 feet 7 inches and aft 2 feet 11 inches. The head room throughout is 5 feet 6 inches.

The cockpit will be water-tight and well scuppered and will be covered with a khaki awning supported on galvanized staunchions. The entrance to the cabin is on the starboard side with the steering equipment and motor controls on the port side of the bulkhead. A 25-gallon water tank will be placed in the bow and under the cross seat in the cockpit will be a 30-gallon gasoline tank.

A great deal of locker room has been pro-



The design of a 70-foot cruiser, by the Bridgeport Motor Company.

vided and the galley to port of the engine is well equipped, with refrigerator, two-burner stove, etc. The engine, a 7½ h.p. Fulton, is just forward of the bulkhead and over it there is a hinged table leaf.

Leading from the engine room is a passage to the cabin, on either side of which are large clothes closets. The cabin is 8 feet 7 inches long with two transom berths, running full length, beneath which are ample lockers.

The boat was designed with a view to her making cruises along the coast, and seaworthiness was therefore the first consideration; and a speed of 8 miles per hour will be obtained.

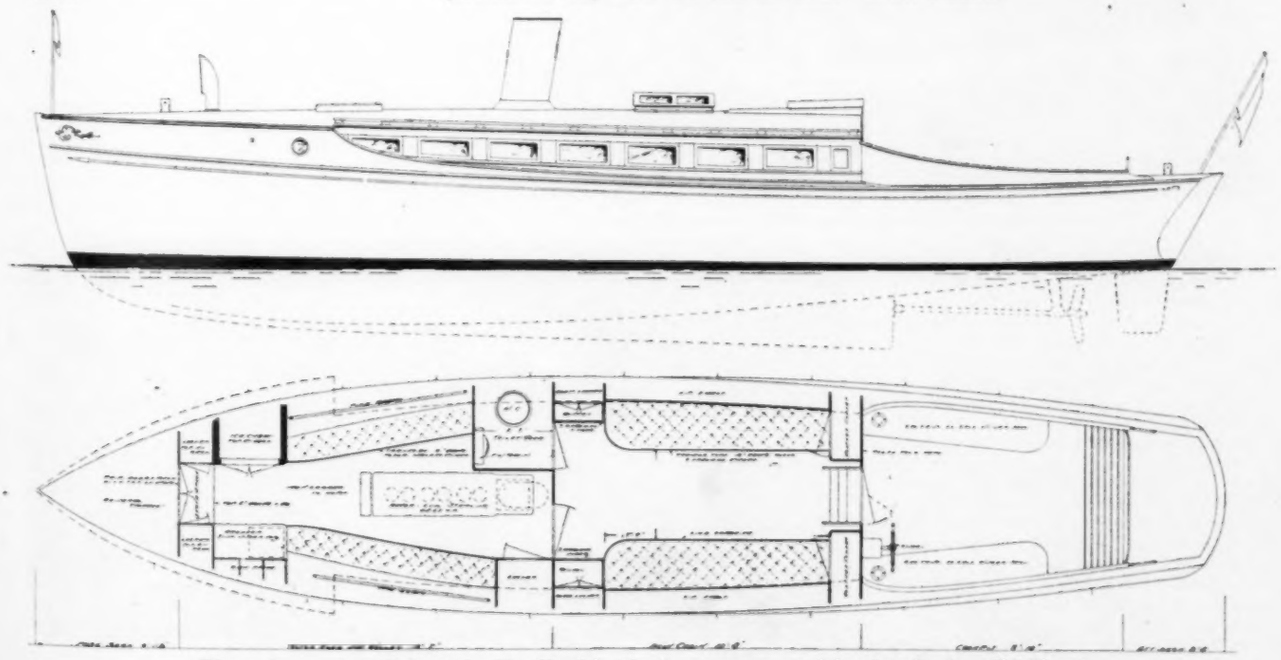
A Fast 40-Foot Cruiser.

THE accompanying design, by William H. Hand, Jr., of New Bedford, Mass., shows a boat now building at the shops of Sanford & Goddard, at Bristol, R. I., for Mr. William Almy, of Boston. The new boat is to be named Quansett and will be used for general cruising, with headquarters at Westport, Mass.

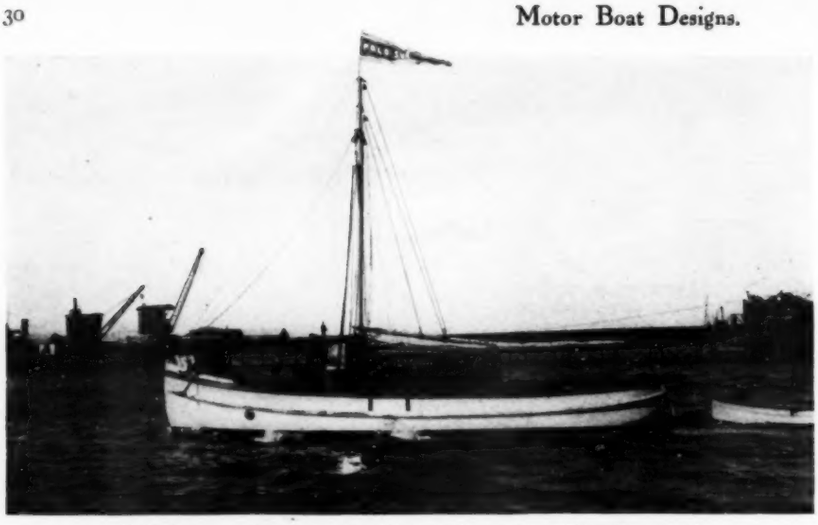
The boat is of very attractive design and is of the fast cruiser type, providing excellent accommodations for four. The general arrangement is clearly shown by the plans, and provides a roomy cabin aft with the motor placed forward of amidships. The general finish is in mahogany, producing a very handsome appearance, and the construction throughout is very substantial.

The motor being installed is a 45-65 h.p., 6 cylinder Sterling, which is expected to give the boat a speed of about 15 miles per hour. The gasoline tanks are placed aft under the cockpit seats and all motor controls are led to the steering wheel. The exhaust is carried out through the stack, which also serves as a ventilator for the engine room.

The principle dimensions are, length, over all, 40 feet 3 inches; beam, 8 feet; and draft, 2 feet 8 inches.



The 40-foot cruiser designed by Mr. Hand is trim in appearance and her interior is well laid out.



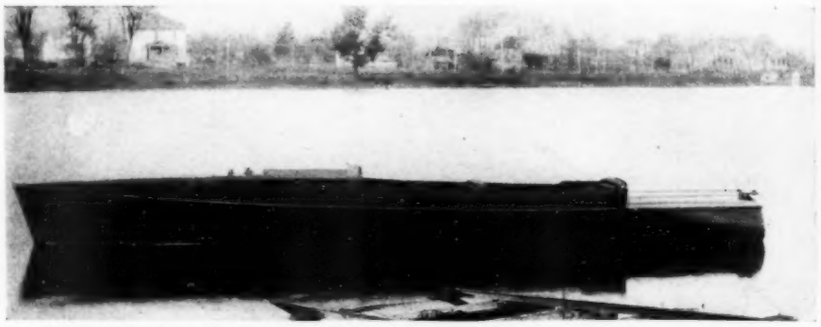
Polo Sur was the first motor boat to be used on Magellan Straits.

Polo Sur, a Pioneer.

POLO SUR (South Pole), of Punta Arenas, Chili, is the first motor boat to be used this far south. She is an interesting looking boat and has been used extensively on the Straits of Magellan in the southernmost portion of South America. She is 40 feet long by 9 feet beam and has a draft of 3 feet. Her engine, a 25 h.p. Ferro, gives her a fair rate of speed, and her performance withal has been so satisfactory that the establishment of motor boating at this point is already assured.

Pistakee One Design Class.

THE Pistakee Yacht Club, of Pistakee Bay, McHenry County, Illinois, has recently adopted a one-design class of motor boats, one of which is shown in the accompanying illustration. During the season of 1909 the club held 17 handicap motor boat races for about 20 trophy cups which were won by 12 different boats. The entries covered every conceivable style of craft from the 40-footer of 60 h.p. to the 14-footer of ½ horse and a half. The handicaps were based upon the best previous performance and resulted in some close and exciting finishes, but of course were subject to the usual criticism. In an endeavor to remedy this as well as to keep within bounds a sport which promised to become very expensive, Com. Jos. F. Haas appointed a committee cosisting of W. S. Moore, Edward Miller, Oscar Miller, and W. P. Lawton, and as a result of their investigation a contract was let for the type of boat here shown. Extreme speed was not the chief consideration, yet the boats will approach 19 miles per hour. They are 24 feet 10 inches over all with 4 feet 1 inch beam. The motor is a 10 h.p., four cylinder Lockwood-Ash, provided with rear starting device and automobile control. The cockpit contains two cross seats and has space for two chairs, accommodating six persons comfortably. The hulls are constructed of white oak, cedar planked, and the decks are of cedar, canvas covered. These boats are building at the yard of the Hunter-Weckler Boat Company, at McHenry, Illinois, and are to cost $445 each. The complete lot of nineteen will be ready for delivery in April.



The one design boats for the Pistakee Yacht Club are building to this design.

Vivace—A 40-Footer.

THE 40-footer Vivace shown in the illustration is owned by Mr. C. H. Remington, of Watertown, N. Y. Miss Remington is shown at the wheel. She is the captain and engineer of the boat and has driven it from Alexandria Bay to Wadington and return, a distance of 117 miles, in one day.

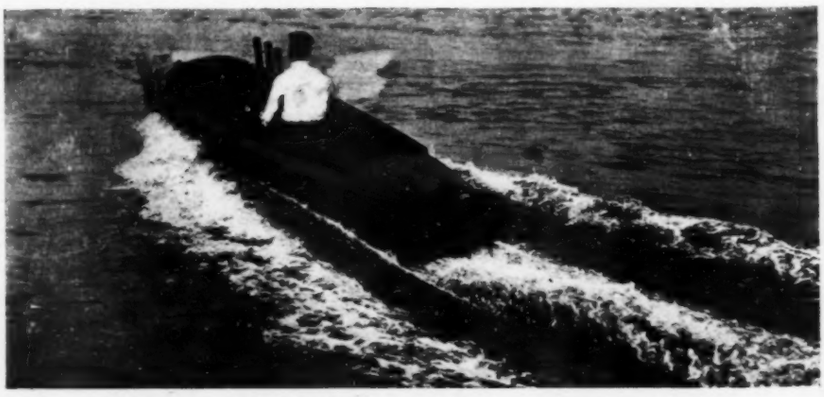
The boat is 40 feet over all by 5 feet 6 inches beam and was originally designed to be equipped with a 200 h.p. engine. The present power equipment is a 45-65 h.p. model B. Sterling engine, which drives her at the rate of 24 miles an hour.

The forty-footer Vivace doing twenty miles an hour.

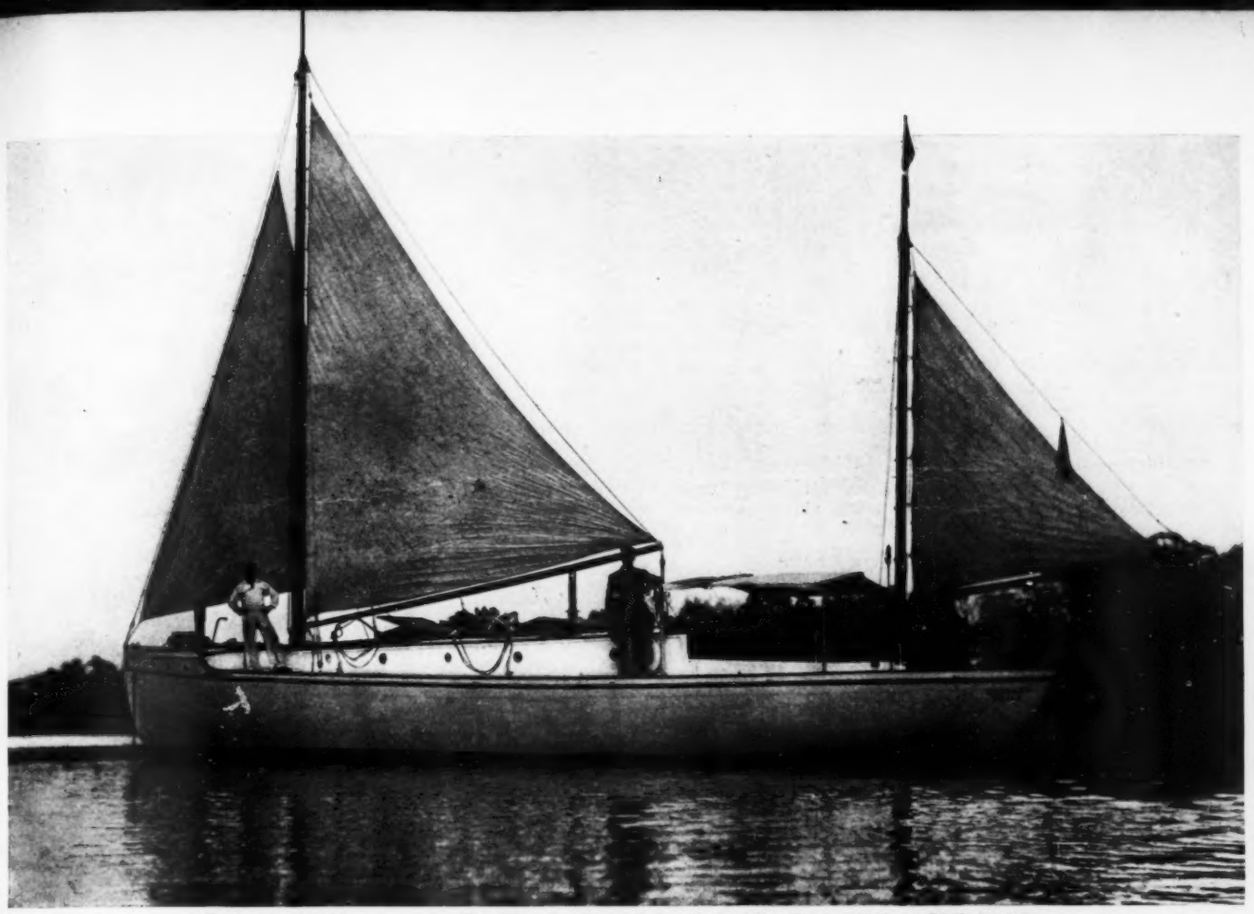
Another Fast Westerner.

ALTHOUGH the East has thus far claimed the supremacy in motor boating, by virtue of its waterways and the number of its boats and clubs there frequently come from the West well founded reports of the remarkable performances of local power boats.

A noteworthy example is the 22-footer, Mosquito, designed and built by C. W. Meyers and E. W. Branger, of Clinton, Iowa. She is 22 feet over all by 3½ feet beam and her power plant is a two-cycle, three-cylinder motor of 4¾ inch bore by 4 inch stroke, rated at 18 h.p. Although not an exceptionally light boat, being built of ⅝ inch cypress over a rather heavy frame and weighing complete with fuel and crew something over 1,000 pounds, she has obtained a speed of 22 8/10 miles per hour, up stream. Mosquito has never been beaten by a boat of her size and in a number of cases has won first prize over 26-footers of double her h.p. During the season of 1909 this boat won eight silver cups besides a number of pennants and other trophies.



Mosquito, one of the fastest boats of her size and power ever built.



Zeeland with her rags on. She flies the flag of the Corinthian Yacht Club of Philadelphia.

Zeeland--Why I Built Her As She Is.

A Real Boat Designed to Hold Her Own in Any Kind of Weather. Some Thoughts About Cruisers as They Are and as They Should Be.

By J. J. de Kinder.

NO doubt many "will be motor boatmen," accustomed to seeing pictures of motor boats flying over or through mountainous seas with half the fore-foot out of water, and usually a big square rigger or an ocean liner or perchance a Gloucester fisherman in the neighborhood making bad weather of it, would think this picture very tame and so it is. It was taken late in the fall while she lay anchored in one of the snuggest little harbors in the Chesapeake Bay, and then I may as well say "in the world," and her canvas was set merely to get a picture with her rags on.

The Zeeland is 53 by 45 by 13 (12 on WL.) by 4 feet; freeboard forward, 6 feet, aft, 4 feet; Standard three cylinder engine, 24 B. H. P.; least head room 6 feet 6 inches; cabin head room, 7 feet; rig and sails as shown; carries one 14-foot power launch and one 13-foot Chesapeake sailing bateau in davits (hinged davits have been removed and solid davits substituted); carries 225 gallons of gasoline in two copper tanks and 140 gallons of water in one galvanized steel tank; speed in smooth water, under power alone, 9 miles (not knots); speed with power and fresh, fair breeze and sails set 10½ to 11 miles, or just enough to leave the usual "12 knot boat" astern.

For dimensions and every arrangement below and aloft, I accept the responsibility, but her hull (and that the most important part) was modelled by that gentleman and master of his profession Charles D. Mower, of New York City, and to his skill is due her strongest point, namely: grand sea-going qualities. She is a most comfortable boat in any weather, any climate or in any season for reasons which I will state. Faults, she has none, in my judgment, for besides the quality named she is a very economical ship. I hoist her pennant in March and lay her up just before Christmas, and on her I spend my spare hours or days, finding the Elixir of Youth.

There are no state-rooms and her cabin is 14 feet long between partitions. From the forward partition one door leads to a bathroom and one to the galley through a passageway. On the port side is a refrigerator with capacity of 800 lbs. of ice and over 20 square feet of wire shelving. From the aft partition double doors lead to the engine room on the port side and a single door through a passageway which has the engine room on the port side and a 7 foot long closet on the starboard side, to the cockpit.

The cabin contains two spring, mattressed berths on each side with ample closets, leaving a clear, unbroken floor space of 7 feet by 14 feet, and there are plenty of port lights in the side of the house and two very large skylights in the top. My reason for having no state-rooms is this: the jigger remains standing when at anchor and in waters where there is not a strong current, her head lies to the wind always if there is any air at all and it allows us to catch all the air which a canvas chute with a mouth 10 feet by 6 feet or 60 square feet and held out by guy lines to the forward rigging and mast, will convey down the forward skylight, and all this breeze is measured out to the occupants of the cabin share and share alike, and with her high head room and port lights the air is always fresh and there is a total absence of stuffiness. If desired, a curtain is swung across and dividing the forward from the after berths, this leaves quite a cabin with bathroom to the occupants of the forward berths.

In cold weather, as in early spring, late fall or winter, the cabin being undivided heats uniformly, and when the stoves are going the jigger is trimmed at right angles to her keel, when anchored, and if there is any wind at all this causes her stern to swing around sufficiently to carry the smoke from the stoves over the side and not aft, and if there is not wind enough for the jigger to act, we carry a guy line from her anchor chain to the towing post aft, paying off a couple of fathoms more chain and the same results are obtained.

The gasoline tanks are located on either side of and above the cockpit floor, out of sight, and as the cockpit is self-baling, I think the risk of trouble in that direction is minimized. The water tank forms the port partition of the bathroom, and hence the starboard side of the passage leading between the bathroom and refrigerator. The tank is only 9 inches wide and is the full length of the bathroom, rests on the keel and is carried to the roof of the house. There are no pipes connected with it and in fact there is not a foot of pipe of any kind under the floor or anywhere out of sight.

As shown in the photograph, there is an awning over the cockpit supported from very heavy staunchions which are bolted through the deck, and I consider this job hurricane proof. There is 7 feet head room under the awning, and extension rods, contained in the upper pipe frames, can be drawn out in a forward direction any distance up to 4 feet, and from these extension rods the awning is carried out as far as necessary to protect the wheelman from driving rains, and of course, there are the usual side awnings, so that there is no trouble in keeping the cockpit dry in any kind of weather.

The engine room has a good, big ventilator on top, a port hole in the side and plenty of

space communicating from it under the cockpit floor to the grating covered hatchway aft, and heat does not bother us.

And now for my reason for having this heavy rigging, for the spars and shrouds and every part proportioned for hard work.

I am a young man (thanks to my love of the sea and my boat) although I bare poled it in the roaring Forties half a century ago. Born by and bred on the North Sea, there lie stored away in the "camera obscura" of my brain pictures of my early boyhood's experiences in the waters along the Dutch coast in all kinds of weather, and in many years spent afterwards "In all the seas of all the world" I learned to love Old Ocean, but at the same time to look upon it with profound respect. I know from experience what a "lee shore" in the Bay of Biscay means and also what it means to "stroke it" in a wintry gale on the Newfoundland banks, and so my idea of a motor cruiser is one that can be depended on in some of the weather that I remember—weather that may be possibly met with when least expected—and I am sure that in this boat, one who understands the handling of a boat need have no anxiety at any time as far as the weather is concerned, for head-on into a nasty sea, thanks to Mr. Mower's skill, she jogs along like a life boat without any pounding whatsoever, and in any kind of weather with the wind abeam on bow or quarter, once her mainsail is set and properly trimmed, she goes like a deep sea fisherman. With her mainsail double reefed or with jib and jigger, I believe, judging from the weather I have encountered in her, that she will ride without green water on deck as long as there is water enough for her to float; and even in a dead calm and nasty ground swell, her mainsail trimmed amidship and acting like a fan, makes her roll very easy.

For ballast, I carry in addition to her engine, stores, etc., about 2½ tons weight, and not the least advantage of this small sail plan lies in the fact that with anything like a breeze over the quarter, she will pick up from a mile to a mile and a half, or she will keep the full power gait with the throttle pinched down.

Of course, power boats "per se" race to Bermuda and other distant places and come through all right, but they remind me of a lot of boys jumping a hole in the ice on skates, for some of these racers are, in my humble estimation, not what they should be, and that is, capable of taking care of anything that may come along, and I am afraid that some time the ice will give away.

The size of these boats doesn't alarm me, for I know that any sized craft with good body and ample freeboard, if properly handled, will take care of herself, provided there is no gingerbread work in the make up below or aloft and especially aloft, and as I looked one of these flyers over last year and recalled to mind a leaf or two from long musty log books, I could not help saying, "Lord, forgive such as these, for they know not what they do."

Not that I am opposed to long distance racing if it is the intention of promoting the science of navigation, but if these races are got up to prove the capabilities of any particular kind of boat, or show what her model can do, then I would call attention to the fact that the ocean waves, though high, mean very little, since they are long, as the usual two-oared pilot boat yawl proves every day in the year, let alone the off-shore fishermen all along the coast, and I believe that every off-shore sailor will agree with me.

Thorough test of the sea-going qualities of any kind of motor-driven boat or motor cruiser can be obtained in home waters, and in the light of my past experiences (perhaps I am getting old fogish despite my youth) I would want to try out my boat before going a long way from home, on the little 14-mile stretch, for instance, between Cape Henlopen and Cape May. A boat that can comfortably manipulate that little distance in a 30 or 40-mile southeaster with the Delaware river tide running ebb, can go anywhere in creation uninsured, except against fire. Age brings caution and perhaps in my instance too much in the eyes of many, but it would be not only deplorable, but a tremendous set back to power boat interests, should the "ice break." Dare-devilism is not seamanship, and a good seaman will hardly condone the substitution of a broom-stick mast set into an awning socket and bolted on the cabin house for a real one properly stayed in the good old way.

For ground tackle I carry a 56 pound and a 90 pound anchor on her bow and I have a 120 pound knock down anchor with 50 fathom of heavy Manilla line stowed handy, and for off-shore work a drag or sea-anchor of ample size to lie to, and with side lights, riding light and flare light always in proper condition, and a can of fish oil on board, and "with a place for everything and everything in its place" I present for the criticism of all a safe, complete and economical cruiser.

Now let me add that I carry one man who keeps everything ship-shape and tends to the galley while I take, for my share, the navigating and steering, a share which I divide only from time to time with some friend who may happen to accompany me. "True happiness lies in the minimizing of care and worry," and that means order and regulation in everything, and order and regulation is the motto in her coat-of-arms. After a hard day's tussle, frequently with the snow flying, what, this side of the last and final anchorage, can at all compare to a snug, smooth harbor, a good dinner decently served with good appointments, on old mahogany, a friend or two —sailors and lovers of nature, also, the evening lamp, the easy chair, slippers and pipe and afterwards an hour or two of spinning yarns of experiences afloat before turning into a dry, well ventilated bunk for an 8-hour watch below?

I look forward to gleaning from MOTOR BOATING something of the Why's and Wherefore's of others.

It's Not Always the Engine's Fault.

The Difficulty of Adapting a High Speed Engine to a Heavy Cruiser. What the Author Learned from Experience and His Conclusions.

By J. Walter Scott.

BY the time I was having my second cruiser built, I imagined that no one could persuade me to try anything that did not have all the proper points for driving this type of craft, but I was mistaken, and it came this way:

A business friend who was interested in a firm building under contract a large number of motors for several firms manufacturing automobiles in Detroit, where I live, suggested they build a motor for my cruiser. They were building very good motors for automobiles, but I immediately told him they would not do for a heavy 40-foot cruiser. He thought they would, but deferred to my judgment to the extent of offering to change the size of the shaft from 1⅝ to 2 inches and put it in their regular four-cylinder, four-cycle, 5-in. by 5-in. motor. I yielded and they built it and it was installed properly, and I started my cruise. It pulled fine and gave us a speed of about ten miles an hour—great for a cruiser of 9-foot beam; but it did this trick for just about a half-hour, and then unless you slowed down to an eight-mile-an-hour clip the motor would heat. I thought perhaps the motor had not been well worked out, and so tried it out at this "nursing" speed for two weeks, but with no better success. Then in disgust at the prospect of having my summer vacation ruined, I determined to take it out immediately. I shopped around Detroit a whole day, and the best thing in a motor for cruising work that I could pick up quickly was a three-cylinder, two-cycle, semi-heavy-duty motor 5½ in. by 5 in. I had it installed, and after tuning up it pulled the cruiser about ten miles an hour with not the slightest tendency to heat, hour after hour without a falter. I had three carbureters put on the motor, and she would run with but slight vibration on one cylinder alone, with two cylinders splendidly, and with three you could hardly tell there was a motor in the engine room. I put the three carbureters on for safety, for if you have but one and it goes wrong in a seaway, it's dangerous; but I found this system had use even when there was no great emergency. Just before reaching a dock, if one or two cylinders were cut out, the speed was cut down so that one could handle the boat better, and it was not so hard on the reverse gear. I think the three carbureters made for economy of fuel, for each one could be adjusted to a hair, so to speak. Once started, the motor gave splendid service, no matter how many hours of continuous running it was forced to do; but at times we had trouble starting up, and for that reason I decided to put in a four-cycle engine for my third cruiser. It is possible that builders of the latest types of large two-cycle engines have overcome this trouble in starting up when cold, for ours gave no trouble once warmed up, starting on the switch, nine times out of ten, even after standing for an hour. In the smaller engine there is no question but that the two-cycle is equally as efficient and as satisfactory as the four-cycle, for we cruised to Chatham, Canada, several times, and there are about fifty small launches owned there and all were equipped with two-cycle engines of different makes in one, two and three cylinders, and it was with surprise and admiration that we watched for hours these little crafts without reversing propellers or reverse gears make the docks. They would rush up as though to ram the dock, the motor would be stopped and reversed in a flash, then started ahead again, and maybe reversed for the second time, and even the third time, all in a space of twenty feet, and not once did we see the dock rammed or the motor "killed." About fifty launches running day and night, and we saw no one in trouble.

HOWEVER, experience with a number of four-cycle engines in automobiles with freedom from trouble in starting has convinced me that with a thoroughly well made motor of sufficient weight, that is the proper type for cruising work. But I have purchased one built by a firm that has had years of marine experience and whose motors have given perfect satisfaction, not to just a few but to many owners of cruisers.

In conclusion, I wish to add that I sold this four-cycle engine that would not stay cool in my cruiser to a boat builder, and told him my troubles before I sold it. He installed it in an open launch of about same length but less beam, and never had any trouble keeping it cool, proving that even automobile types of four-cycle engine are all right for *light* work.

Counterbalancing the Rudder.

Automobile Fly Wheel Used to Ventilate the Cabin of a Cruiser. What Has Become of the Humphrey Bill? Letters from MoToR BoatinG Readers.

Counterbalancing the Rudder.

To the Editor of MOTOR BOATING, *Sir*: All last summer we had considerable trouble with our steering. I have a 32-foot speed boat with with a 6-cylinder 30-45 horsepower engine. The rudder that the plans called for was hung outboard and extended with its long dimension vertically some distance below the propeller. This arrangement made the draft excessive and to remedy the matter we turned the rudder the other way. That is, we hung it with the post in the same position but with its long dimension horizontally. This, however, made the boat cranky and making quick turns was almost impossible. Even at times when we were running straight, a slight turn of the wheel would cause the boat to roll, sometimes even to the extent of shipping water over the sides. What do you think is the trouble and what can we do to remedy it?

FREDERICK F. MARCKWARDT.

Grand Rapids, Mich.

[If your rudder was designed according to the original plans we will assume that its area is about right. The crankiness you speak of was undoubtedly caused by the excessive drag on one side or the other of the boat, according to which way the rudder was thrown. This drag was not such a serious matter when the rudder was hung in the vertical position, as it came nearer the center line of the boat, but when hung horizontally the drag was farther from the center line, with the natural tendency, when applied quickly at high speed, of tipping the boat. We would suggest as a remedy that you mount the rudder so that the rudder post will come from one-fifth to one-third the distance from the forward edge. This will tend to equalize the drag, bringing it nearer the center line, and we believe, from what experience we have had with similar cases, that this will overcome the objectionable features you mention.—ED.]

The A. P. B. A. Rating Rules.

To the Editor of MOTOR BOATING, *Sir*: As chairman of the Power Boat Racing Committee of the Chesapeake Bay Yachting and Cruising Association, which is composed of 7 clubs in this vicinity, I am writing to inquire whether the Marblehead Race and the New York-Albany Race are run under the A. P. B. A. rules. In every race with which I have been associated there has been some difficulty and numerous "kicks" in reference to the methods of handicapping and I have noticed with interest the results obtained in the races above mentioned.

EDGAR SMITH LINTHICUM.

Baltimore, Md.

[The Marblehead Race and the New York-Albany Race, together with the Bermuda Race, The Lake Ontario Long Distance Race and the Gold Cup Races, have been run for several years under the rating rules of the American Power Boat Association.—ED.]

Novel Method of Ventilation.

To the Editor of MOTOR BOATING, *Sir*: Thinking that the following experience may be of interest to your readers, I am sending it to you herewith. Last summer I ran across a unique scheme for the ventilation of the small cruiser. The engine of the boat was situated just inside the cabin, making it very "stuffy." After putting up with this inconvenience for a while the owner took off the flywheel of the engine and put in its place an automobile flywheel of the fan type; that is, built with the spokes in the shape of fan blades. He had a casing made to go around the flywheel with the bow side open and with an exhaust pipe leading from the after end. Then he installed three ventilators, one in the bow of the boat that came flush with the ceiling and two others in the after end of the cabin to which were attached flexible canvas pipes that extended nearly to the cabin floor. This system solved the problem of ventilation perfectly, and when the engine was running one could see the smoke from his pipe make its way to the engine and disappear through the flywheel.

WM. H. COUSINS.

Westboro, Ontario, Can.

Regarding the Humphrey Bill.

To the Editor of MOTOR BOATING, *Sir*: In the February issue you devoted page 7 to National Motor Boat legislation and said that

(*Continued on page* 50.)

The Prize Contest in Questions and Answers.

ON pages 34, 35, 36 and 37 appear the answers to the questions which were printed in the March issue of MOTOR BOATING. The making of a "home made" sextant, the ventilation of cruiser cabins and the tender for the medium length cruiser are all considered and thoughtfully treated The answers are all good ones. It is everybody's contest—come in.

NOW a word about the prizes. We must insist that contestants state definitely what they want for prizes when they send in their answers or submit their questions. They must give accurate instructions for ordering and shipping. We have experienced considerable difficulty in determining what some of the prize winners would take as prizes and it has resulted in a whole lot of unnecessary labor and loss of time in delivering prizes. We must also insist that each contestant select some one product whose advertised price is either $25.00 or $5.00 and not a collection of different articles whose prices add up to either of these figures, or a credit on some advertiser to be used up as the winner sees fit. We would except, however, such articles, spark plugs, for example, as can be had by the half dozen or dozen as easily as they can singly.

READ the general conditions again: We will give prizes to those who send in the best answers to the questions printed herein each month, and in order that the contest may be helpful to the greatest possible extent, we will give prizes for the best and most practical questions submitted for the next following competition. There will be three questions in the contest each month, and therefore three prizes for the answers.

THE QUESTIONS FOR THE JULY CONTEST ARE THESE:

For an open motor boat which must be left at a mooring, what is the best type of covering and method of construction? Sketches are desirable.

Suggested by W. N. Washburn, Fort Wayne, Ind.

What is the best method of removing and replacing piston rings?

Suggested by T. P. Archer, Louisville, Ky..

What methods may be used in treating the bottom of a boat preparatory to a race to obtain increased speed, and what can be gained from such treatment?

Suggested by W. H. Ellison, West Philadelphia, Pa.

Answers to these questions, addressed to the Editor of MOTOR BOATING, 1789 Broadway, New York, must be:

(*a*) In our hands on or before May 28th, (*b*) not over 500 words long, (*c*) written on one side of the paper only, (*d*) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired).

Questions for the next contest should reach us on or before the 28th of May.

THE PRIZES ARE:

For each of the best answers to the questions above, *any article* advertised in MOTOR BOATING, of which the price does not exceed $25, or a credit of $25 on *any article* advertised in MOTOR BOATING, which sells for more than that amount.

(*There are three prizes, one for each question, and a contestant need send in an answer to but one, if he does not care to answer all.*)

For each of the questions selected for use in the next contest, *any article* advertised in MOTOR BOATING, of which the price does not exceed $5, or a credit of $5 on *any article* advertised in MOTOR BOATING, which sells for more than that amount.

For all non-prize-winning answers published we will pay space rates.

To all who send in answers we will give a reproduction of one of our double-page photographs, on heavy coated paper (14 x 20 inches), uncreased and suitable for framing. They are very striking and beautiful.

When you send in your answer state what you will take if you win the prize.

How To Make a Sextant.

Instructions and Drawings for the Construction of a Practical Instrument for Ordinary Use. A Device Useful for Many Purposes Besides "Bringing Down the Sun."

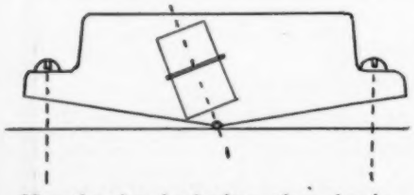
THE PRIZE CONTEST—Answers to the First Question in the March Issue.

THE actual construction of a sextant is not very difficult to one having some mechanical skill and a little ingenuity. The mechanical arrangements are simple. In its ultimate form the sextant consists of two mirrors, a short distance apart and parallel

A metal protractor may be used.

to each other. One of these is arranged so as to be movable around a horizontal axis and has means for measuring the angle through which it moves. In the accompanying diagram the general arrangement of the parts is shown. The eye looking through the peep hole or telescope looks through the upper part of the mirror A at the object. Through the lower part of the same mirror one sees the same object reflected from the mirror B, and if the instrument is in adjustment and at zero, the two halves of the object will be seen perfectly matching. If now the mirror B is moved by the arm C to bring some other object so as to match the first one the index D will have moved through exactly half of the angle between the objects. For this reason the graduations on the sextant are half the size of those on any other ordinary instrument for measuring angles. The upper half of the mirror A is transparent in order that the telescope may have a clear field to the distant object.

In making a sextant the task is best commenced by securing an arc already graduated. These can be had at any artist material store or any place where drawing-paper and drawing instruments are for sale. We may use a paper half circle about five inches in diameter graduated to half degrees or a full circle eight inches in diameter or a larger circle about thirteen inches in diameter graduated to ¼ degree. It is even possible to use the ordinary brass instrument graduated in degrees or half degrees. In making our instrument, however, we need an arc of about sixty de-



Mounting for the horizon glass showing method of adjustment.

grees only, this gives a reading of 120 degrees. In paper we cut out that much of the circle and in doing so include the center with the portion which we removed. One of our diagrams shows the sector cut from the protractor and the dotted line indicates the block upon which it is to be mounted. As the large protractors are divided to quarter degrees they are more convenient to use than the smaller ones, because each degree in our sextant is then divided into halves.

When using the larger size protractor a piece of wood of approximately seven inches

Making a Sextant.

(The Prize Winning Answer.)

in its longest side will be needed. There will probably be needed half or three-quarters of an inch space all around the part of the protractor that is used. The wood should be thoroughly dried and straight grained. When finished it should be shellacked all over to keep out moisture. When thoroughly dry on the upper surface, shellac should be applied until the whole of the space to be occupied by the paper is sticky. The paper is then applied, pressed down firmly and allowed to dry. Paste will not answer, as the paper swells out of shape with moisture. When the paper is dry it should have a coat or two of white shellac. At the point X or place where the center of the protractor is indicated we now bore a hole all the way through the wood. It must be truly perpendicular to the surface. This should be large enough to take a small stove bolt not quite long enough to go through the board. The underside of the hole should be countersunk so that the nut may be flush.

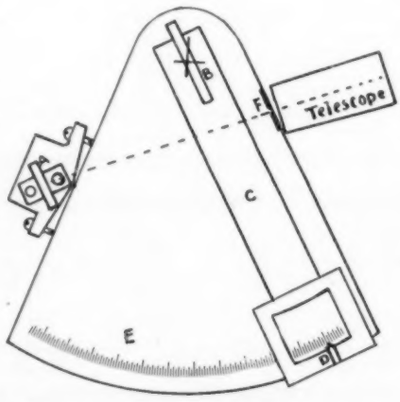
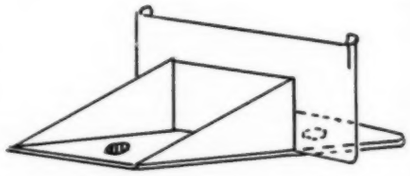


Diagram of the completed instrument.

The index arm should be made of a straight, flat piece of brass; stout printers' rule does very well, or any piece of brass a sixteenth of an inch or so in thickness. On the outer end of this the index beam is a rectangle with an opening in it, made from a piece of common sheet zinc. The hole is cut in it and the point of zinc soldered upon it for an index or pointer. The distance from the pivot of the arm to the point must be so that the point will just sweep over the arc, touching the outside of the graduations. Upon this arm is to be fixed a piece of looking-glass placed directly over the pivot. The piece of looking-glass must be set perfectly perpendicular and one of the evidences of its correctness is that when looking into it so as to see the reflection of the arc, the curve seems to be perfectly unbroken. For a six or seven inch arc this piece of looking-glass should be approximately one inch wide by two inches long. The other piece of looking-glass should be one inch wide and an inch and a half high with the silver removed from the upper half.

Only the finest kind of plate glass mirror as thin as can be obtained is fit for these glasses. Glass can easily be tested by placing it upon the table so as to see the bars of a window reflected in it. If the bars remain perfectly straight over all portions of the glass and if the eye is at considerable distance from the glass the surface may be accepted as fairly satisfactory. In moving the eye the reflection should not show any sign of waving or bending. To make frames for these glasses one may use thin brass and bend up the edges over the glass. The mounting of the mirror A, or as the scientific people call it, the "horizon glass," is a matter of considerable ingenuity. There must be two adjustments. It must be swung through a very small angle



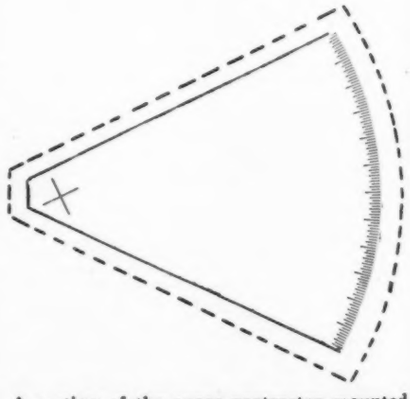
The metal holder for the horizon glass.

horizontally and it must be tilted forward or backward from the telescope. A block of wood about the same thickness as the base is cut out of the shape shown, one side being slightly beveled each way from a small groove which is made perpendicular to the face. At the ends two long wood screws are fitted to go into the base. Adjusting the screws gives a certain amount of swing horizontally. On top of this block we arrange to mount a little frame made of sheet brass to hold the horizon glass. Its construction is so plainly shown in the sketch that description is hardly needed. A screw front and back gives means for tipping the glass to or from the telescope or peep hole.

With the arm so arranged as to be on the zero mark or nearly the position which is shown in the sketch the peep hole, or telescope, (either can be used) should look squarely into the horizon glass A, and when in perfect adjustment a distant object should be seen, half of it directly and the other half in the reflection, and the two portions should match.

A convenient handle is made by using part of a common door latch, which is screwed upon the back of the instrument.

The peep hole may be in a piece of metal or wood, an eighth of an inch in diameter, placed at the point shown in the sketch. If one wishes to be still more elaborate a com-



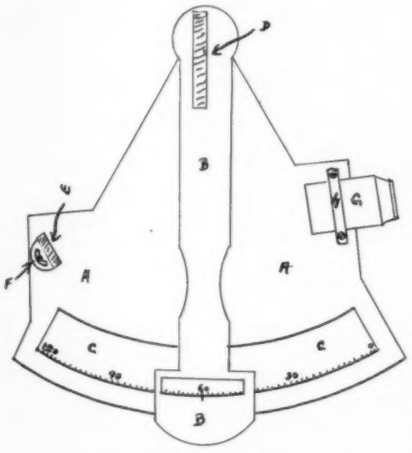
A section of the paper protractor mounted upon a wooden base.

mon telescope, like those used for children or half of an opera glass, can be put on by a bracket in the position indicated.

All this is comparatively simple and is quite within the reach of any mechanic. The part

that requires patience is the making the adjustment so that a very distant object, like a flagpole or a telegraph pole will be seen in both halves of the horizon glass, and the two halves match. When the instrument is first put together, while the glasses may seem perfectly parallel, yet the images will be far separate. In manipulating the screws do it a little at a time and, at first, by having them so loose that the horizon glass can be moved by the finger, one gets quickly the idea of how the screws must be manipulated to bring the parts of the image together.

It may sometimes be possible to get pieces of perfectly clear glass that are not properly silvered. Silvering is by no means difficult.



Mr. White's Sextant.

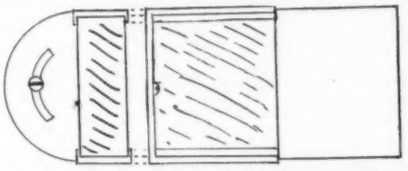
Clean the glass perfectly. Smooth out a piece of tinfoil of proper size with the fingers and pour upon it a few drops of mercury. Clean the surface of the mercury with a scrap of card, wiping all the dross away. Lay a piece of clean writing paper upon the mercury and put the glass upon that. When in position pull out the writing paper, leaving mercury and glass in contact. After a little while carefully turn the glass up at an angle to allow the mercury to run off. After a day or two it may be shellacked if the tinfoil has become solid. If one has access to an optical shop where lenses can be purchased it is easy to make a telescope by using paper tubes and spectacle lenses. The latter should be round, and not those cut to shape.

In making the adjustment, the object sighted at should be as far away as possible. When the instrument seems to be perfectly adjusted on a nearby window it will become altogether off when tested on the horizon, or a distant object. Straight vertical or horizontal lines are best for sights.

W. E. PARTRIDGE, New York City.

A Practical Sextant for Ordinary Use.

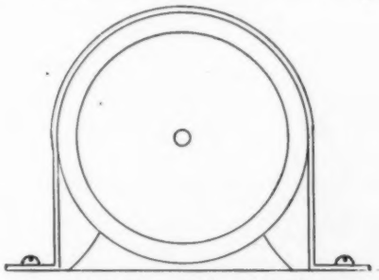
AT first thought it seems quite a difficult job for an amateur to make an instrument that is sold for such a price as most sextants bring. But if the amateur will follow the directions given here he will find that he is able to make a sextant for a dollar



Plan and elevation of the holder for horizon glass.

or two as good as he will need, unless he contemplates long off-shore trips.

The base of the instrument, A, should be made of a dry piece of Spanish cedar or mahogany, or any similar wood which will undergo climatic changes without shrinking and swelling to a large extent. The base should be ¾ inch thick and finished with great care, as it is highly important the the upper side of the base be absolutely flat. Next get one of those paper protractors that are 14 inches in diameter and are sold by nearly all drawing material stores and cut out a piece of 60 degrees, shaping it as shown at C. Give the base a thick coat of shellac and put on the paper scale while the shellac is sticky, then shellac over the scale and base on both sides. The 30 degree mark on the scale should



The method of mounting the telescope.

be exactly in the center of the arc, that is should lie on a line through the pivot and bisecting the angle of the base. The numbers on the protractor should be scratched off and just doubled, that is, 60 degrees should be 120 degrees and 35 degrees should be changed to 70 degrees, and so on. If there are no notations on the protractor put them on with India ink. The arms should be made of 12 gauge brass cut in the shape shown at B. The distance from the vernier, which is cut out to show the scale below, to the spindle at the center of the index glass at B should be exactly seven inches. The spindle should be of steel and set in on top of the arm so that the index glass, which is a very fine plate glass mirror, can be cemented over. The face of the mirror should be toward the horizon glass E, which should be made as shown in detail drawing, the lower half mirror and the upper half scraped clear. This glass should be a fine piece without any imperfections and should be mounted on a 20-gauge brass holder as shown. The lower part of the holder being exactly at right angles with the face of the glass and having a slot cut for an adjusting screw.

The sight G can either be a cheap telescope or a pastboard tube blackened on the inside

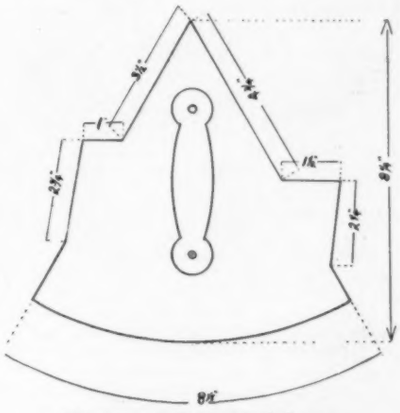


Diagram of the sextant's base.

and fitted with a small hole at one end and a removable smoked glass at the other. The large lens of the telescope, if one is used, may be smoked on the inside. The detail drawing shows how the telescope is mounted so that it is parallel to the base and exactly centered on the dividing line on the horizon glass. The collar H is a strip of 20-gauge brass.

The horizon glass E should be set so that it is perpendicular to the base and parallel to the arm when at zero. The index glass D should be 1¾ x 1 inch set horizontally on the arm and should also be perpendicular to the base and parallel to the horizon glass when the vernier is at zero. The line of sight of the telescope should be exact with the center of the horizon glass and the instrument will be a failure if all these adjustments are not made perfectly.

If you find that the vernier doesn't strike the exact circle of the protractor take a small file and carefully file it down until it is a perfect arc and coincides with the protractor arc.

GERALD T. WHITE, New York City.

Ventilating the Cabins of Small Cruisers.

The Difficulties That Are Met With and the Methods of Overcoming Them. A Number of Practical Solutions for this Important Problem.

THE PRIZE CONTEST—Answers to the Second Question in the March Issue.

IT were well to depart somewhat from the strict letter of the question as there are some places which need ventilating as much, if not more than the cabin itself.

Most small cruisers have the engine under the cockpit floor with possibly the fly wheel projecting into the cabin and without oil and water tight bulkheads. Any stray gases beneath the cabin floor as well as the heat and odors under the cockpit should be carried away by the ventilating system. The first difficulty is to let in the fresh air and at the same time keep out the water (sea as well as rain). All portions of the ventilating flue in-

Cheap and Easy to Install.

(The Prize Winning Answer.)

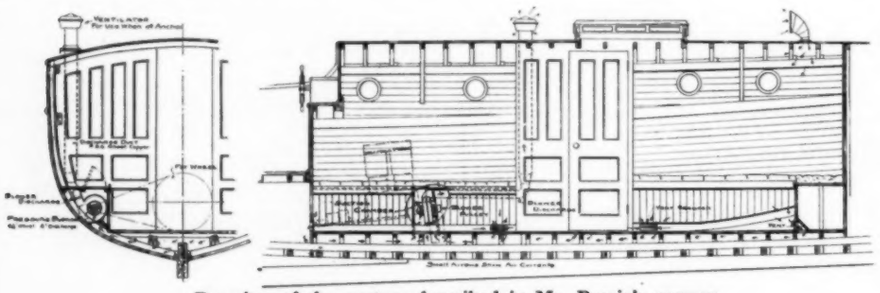
side the boat must be handy yet out of the way, while anything above decks must be made to fold up for stowing. Any fittings on the deck must not leak and must be closed with a cover when the hood is stowed away. The ventilating apparatus must be absolutely automatic and require no attention to speak of, easy to install and cheap.

Each boat is a problem in itself but for an example assume a boat in which the small cabin has a galley at the aft end. There are no partitions and the fly wheel of the engine, which is under the cockpit floor, projects into the cabin.

Well forward in the deck cut a hole at least 6 inches in diameter; just forward of the cabin is a good place, as the pipe inside will then come in the chain locker. Around it fit a brass flange well bedded in white lead. A light weight 6 inch pipe flange will do nicely, and a 6 inch pipe plug makes a fine cover, easily put in and taken out and tight. There are many different styles of ventilator cowls made which can be adapted to this deck

flange. Some very good ones are advertised in the MOTOR BOATING. Take a piece of tin pipe such as is used for hot air furnaces and fasten it to the under side of the deck at the opening. This should be somewhat larger in diameter than the opening and long enough to reach to the keelson. A square pipe is easier to put in, but a round one is easier to make.

In this pipe at the top of the cabin is a hole, say for the 6 inch pipe, 4 inches wide and 6 inches long, with a damper just below it. About 3 or 4 inches above the cabin floor is another hole and damper similar to that above. The bottom of the pipe is left open and bent aft looking under the cabin floor.



Drawing of the system described in Mr. Bowie's answer.

Now we want to remember that fresh air cannot be led or forced into the cabin unless the old air is led or forced out, so make port in the aft end of the cabin over the stove to use when the companionway is closed. For the same reason we will make a small hatch in the cockpit under the lazy seat or better in the after deck.

In warm weather turn the cowl to the wind and close the lower damper in the pipe just enough to force most of the incoming air into the cabin, allowing the rest to continue on under the cabin floor beneath the cockpit and so on out through the small hatch. Make a hood of light galvanized iron and hang over the stove and connect the peak of it with stove pipe to the port in the aft end of the cabin, so that the outgoing air will take with it all odors and smoke of the cooking.

In cold weather use the upper damper instead of the lower one and the floor of the cabin will be warm. When at anchor and there is no wind, open both dampers. In very cold weather turn the cowl from the wind and cover the upper hole with a piece of cardboard or canvas.

A little experimenting with this ventilating system in the individual case will give remarkable results in the way of fresh air.

W. G. A., Portland, Me.

Scoops Best for Small Boats.

THE difficulties of ventilating the cabin of any small boat are due to the fact that it is necessary to make the ports so small that they do not allow a sufficient amount of air to circulate, and this is true especially when the boat is only used once a week as is the case most generally with small cruisers. All ventilation being stopped when the ports and skylight are closed for several days is bound to make the cabin musty and this is a hard odor to get rid of. The next, and probably the worst, is when necessity compels the installation of the engine within the cabin. The galley stove is another item to contend with, but as eating is one of the most important features of cruising and one we cannot do without, it is impossible to dispense with the stove.

There have been many schemes used to overcome these difficulties and all who visited the recent Motor Boat Shows no doubt saw the latest—a blower connected to the engine. While this will probably work wonders while the engine is running it has the drawback of becoming useless as soon as the engine is stopped, and the added cost makes it seem unsuitable for the smaller boats. Wind scoops form a good scheme for ventilating a cabin and if used with a ventilator should furnish all the air necessary for any cabin. By setting the ventilator well forward and fitting the scoops to all the ports they should draw in any air that is stirring and it will be carried out by the open cabin door.

When leaving the boat a canvas cover with a draw string to it may be fitted over the ventilator to exclude the rain and after the scoops are removed close all the ports but two, one forward and one aft on opposite sides. A tinsmith will make two scoops that may be fitted to these ports so they may be left open without any fear of a storm injuring the contents of the cabin. They are similar to the ordinary ones, but should have the outboard end well bent down so there will be no chance for the rain to beat in. If in a place where you are afraid of thieves remove everything within reach of the ports and as it is impossible for a man to crawl through them there is little danger of missing anything. This will allow the fresh air to circulate freely within the cabin and as good air is the best preventive from dampness and mustiness the cabin should be sweet and odorless no matter how long the boat is idle.

E. A. CRAWFORD, Newark, N. J.

Blower Belted to Motor.

THE principal difficulty in ventilating the cabin of a small cruiser lies in the fact that vitiated air and gasoline vapors, which comfort and safety require to be removed and replaced with fresh air, are heavier than pure air, and therefore, sink to the lower part of the boat, from which they must be lifted and discharged at a level considerably above where they lie.

In fair weather and with flat seas, open skylights and ports bring in such a flood of fresh air that these heavy gases are diluted and flushed out of the cabin, but with weather that makes closed ports and clean decks necessary these means of ventilation fail, and some method of changing the air that is independent of weather conditions must be employed, and nothing is better suited to meet this requirement than a small blower belted to the flywheel of the engine.

These small blowers can be obtained in various sizes; the smallest having a wheel about six inches in diameter, at 4000 R.P.M. will discharge 100 cubic feet of air per minute, furnishing ample ventilation and requiring less than 1/10 H.P. to drive.

As the gases to be discharged lie low down in the boat the inlet of the blower should be connected to draw from the lowest point possible, and with the usual type of these blowers this may be best accomplished by surrounding the blower with a tight box or suction chamber connected with the space under the cabin floor, which in turn opens into the cabin through small registers or gratings set in the face of the lockers or transoms near the floor.

The suction chamber is best provided by partitioning off a portion of a locker alongside the engine, allowing width to just clear the fan bearings, the driving pulley projecting through one partition, the opening being closed tight around the shaft with galvanized iron.

Connect the blower discharge with a duct which should be carried in the most direct line through the raised deck or cabin top, enlarging the vertical run to 5 or 6 inches if possible, and soldering it to a deck plate where it meets the deck. A small hood is to be used to prevent rain or spray entering.

The main object in bringing the discharge duct up to the deck is to provide a method of ventilation when the engine is stopped, by the use of an aspirator hood, similar to the "Royal," "Star" or "Globe" which are so constructed that wind blowing through them will raise and discharge considerable quantities of air.

One of these 4 or 5 inches in diameter attached to a piece of tubing long enough to raise the hood a foot above the deck will, when connected to the discharge duct, remove the foul air from the boat and make the cabin habitable when closed up and laying at anchor.

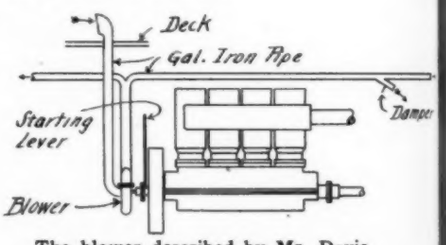
A small hood located well forward can be provided to supply fresh air, but if extreme weather makes it necessary to close even this opening sufficient air will leak through closed companions and skylights to replace that which the blower removes.

The method described has the advantage that it not only ventilates the cabin but keeps a constant current of air in circulation through the frame, bilges and lockers keeping them sweet and preventing mould and rot.

ALFRED W. BOWIE, JR., New York City.

Positive Blower Best.

ON entering the cabin of a small boat one is usually struck with the closeness of the air. This is due in part to the contrast between the quiet air and close quarters within with the fresh breeze and great freedom on deck, but no one will deny that the air inside is often bad.



The blower described by Mr. Davis.

Small craft, as a rule, can only be ventilated by means of openings in the top or near the top of the cabins and in wet weather it is often difficult to keep even these open. Now as water, vapor and a good many of the obnoxious gases are heavier than air they settle down and remain inside unless forced or drawn out by some means. By the use of cowls, windsails, etc., a great deal can be done towards removing these gases, but in using these it should be seen to that the fresh air is led to the bottom of the cabins so as to create an upward current to carry out the dead gases. Some positive mechanical means of ventilation is, however, much to be preferred.

There are two methods or systems of mechanical ventilation. In the one the foul air is drawn out and the fresh air to take its place finds its way in through cracks and other openings. In the second method fresh air is forced in when it is wanted and the foul air finds its way out as best it may. Sometimes these two methods are combined, but it only adds complications which make it inadvisable in a small boat. Of the two methods I believe the second the best suited for a small boat, although it has some points against it, for the fresh air can be drawn from high enough up so that it will be fairly dry even in the worst of weather and the outgoing air will tend to keep rain and spray from entering ports and other openings.

A forced ventilation system driven from the main engine is simple and inexpensive. It would consist of a small, 2 or 3 inch, blower;

some galvanized sheet iron pipe, similar to conductor pipe; and some simple dampers to regulate the various outlets. The accompanying sketch shows, somewhat diagrammatically, how these would be arranged.

The air should be taken from some point high up where it will be dry at all times—a hollow mast would be excellent. It is then conducted to the blower which can be either direct connected, as shown, or be driven by means of a belt. Belts take power and when short should be avoided. I might say right here that such a blower as will be required takes very little power when working and that when all the dampers are closed it takes practically none. From the blower the air is led to the various places where fresh air is required. By attaching the ventilating system to the main engine we have the objection that it is only available when the engine is running. That is true, but when the engine is not running the boat will be in quiet water and all openings can be cleared.

O. M. DAVIS, Evanston, Ill.

Sky-light Essential.

IN ventilating the living quarters of small cruising motor crafts it will be found necessary to carefully protect all the required openings from water, whether in the form of rain or flying spray. This latter is much more difficult of exclusion upon the smaller cruisers since their limited freeboard renders them relatively wet sea boats and consequently in case of bad weather all ventilating openings should be arranged to close tightly.

In the consideration of any ventilating problem it should be borne in mind that not only must pure air be constantly admitted from without but the vitiated air must be allowed an equal opportunity to escape. In other words a free circulation of air through the compartment must be induced.

A cowl ventilator upon the cabin top forward, as frequently employed by our best designers, seems to be the most effective means of admitting fresh air below. Should the boat be fitted with a sky light the coaming may be made square so that the sky-light may be turned with one sash opening forward, thus serving as a sort of scoop to carry quantities of pure air into the cabin. In bad weather the sky-light is of course turned at right angles so that its "gable end" faces forward. A sky-light of some sort should be specified even upon the smallest cruisers. Few accessories are as great factors in insuring cheerfulness and comfort in the "regions below" and a good sky-light is well worth all it costs.

In cruisers of fair size a square hatch in both the forward and after decks assist greatly in keeping the air sweet throughout the entire boat. These hatches are often fitted with gratings and the hatch-covers are left off except in bad weather. Screw ports in the sides of the cabin house are useful for ventilating purposes and while rather expensive should be given the preference over fixed lights whenever possible.

The companionway offers a natural exit for the air current from the cabin and is often fitted with slatted doors so that, with the cowl ventilator forward, the circulation is constant even when the companion slide is drawn and the doors locked. When a self-draining cockpit is fitted it is an excellent idea to use a pair of "ice-house pattern" deck ventilators in the after deck to keep the air clean in the space beneath the cockpit floor and in the lazarette. These may be tightly screwed down in severe weather, but this precaution will seldom be found necessary upon craft used only for summer cruising.

All ventilating openings should be left open whenever the weather will admit of it. This is particularly true in those cases where the motor is located below decks. The safety of the boat and her crew demand perfect ventilation and neither trouble nor expense should be allowed to prevent the installation of an efficient system.

ALLAN O. GOOLD, Portland, Maine.

The Tender for a 30-Foot Cruiser.

What is the Best Type and Size of Boat for This Purpose, And How Can It Be Disposed of When on a Cruise? Some Satisfactory Solutions.

THE PRIZE CONTEST—Answers to the Third Question in the March Issue.

The "Dory-Skiff."

(*The Prize Winning Answer.*)

THE accompanying drawings show the lines and dimensions of what the writer considers one of the most satisfactory tenders for the small cruiser.

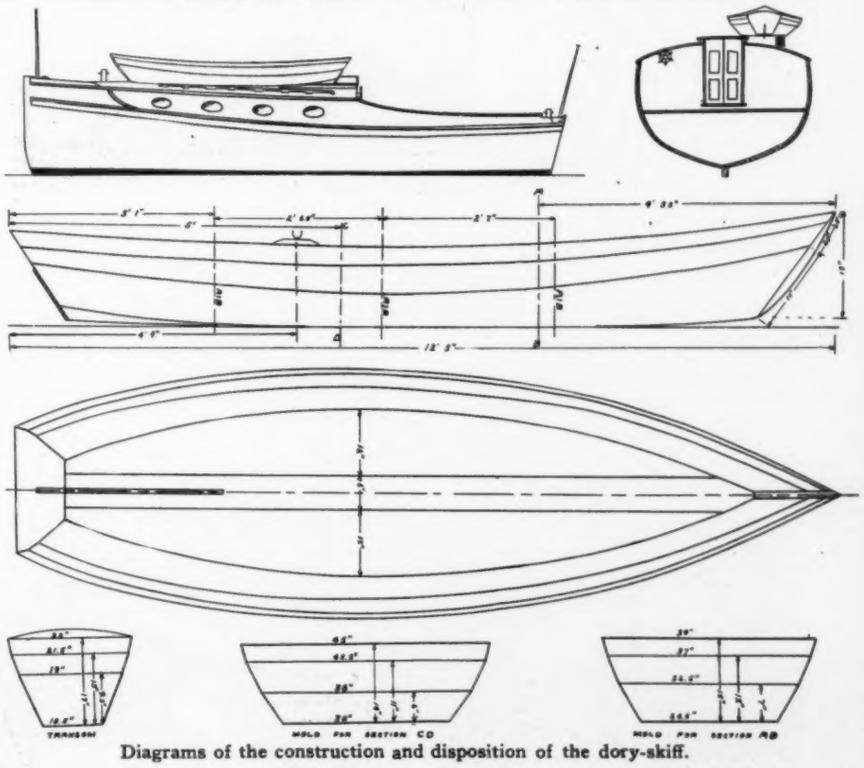
This type of boat is called the "Dory-Skiff." We are all familiar with the dory and know its seaworthiness, and by combining its lines with those of the skiff we get a type of craft retaining the seaworthiness of the former and eliminate its "crankiness".

There are several of this type of craft in use and upon the market, but the writer has found by experience that they are not built with sufficient fullness of lines and width of bottom to give a very stable boat. A dory-skiff built from the lines of accompanying drawings gives a craft that one weighing 150 lbs. may stand upon the edge without capsizing. Therefore it is a very safe craft, especially so for any lady members of the "crew". This boat, if built of the following material and thickness will not weigh over 100 to 125 lbs., giving a boat easily handled by one man.

Construction: Sides, bottom, and transom of white cedar. Sides ½ in. thick; bottom ¾ in. thick; transom ¾ in. thick. Bottom planking to run lengthwise. Ribs of oak, 1x1½ in., planking fastened on 1 in. edge. Strip 1x1¼ in. running across bottom from rib to rib, securely fastened by screws. Strip 2x1 in., running fore and aft on edge between angle of sides and bottom. Stem of oak, made to suit the builder. False bottom of small strips made up in sections running fore and aft. May be of ⅜ in. strips, or heavier, about 1½ in. wide, spaced 1 in. apart.

In regard to carrying the tender when on a cruise, the drawings will show what is believed to be the best method. The writer's points of argument in its favor are as follows: We all know how undesirable and unsightly it is to carry a tender in the cockpit. One end always hangs outboard, and there is no room for anyone except the helmsman. Also we know in a seaway it is undesirable to tow the tender, especially so with a stern sea. By carrying it on top as is shown in drawings, we have it entirely out of the way. It does not interfere with the helmsman, neither does it hinder from slipping up alongside of a dock or other boat. Its weight on the one side is balanced on the other by that of the helmsman. The writer has taken an extreme case in illustrating the relative size of the tender to that of a cruiser, by considering a 28 ft. cruiser, which is about as small as is in general use. The drawings of both cruiser and tender are to scale and show space occupied by the latter.

With a tender of the size and weight of the one which is recommended, one man may easily get it aboard and lash securely in a very short time; and it may be quickly slid overboard in case of emergency. A boat of this size is not sufficient to make the cruiser top heavy.



Diagrams of the construction and disposition of the dory-skiff.

L. H. HARRIS, New York City.

(*Continued on page 50*).

Talks With Our Naval Architects.

James A. Smith.

JAMES A. SMITH is one of the most prominent of the younger school of British Naval Architects. Apprenticed when 15 as a shipwright at the Linthouse Shipyard, Glasgow; he soon became a junior ship-draughtsman and subsequently finished his training at the Denny Bros. yards at Dumbarton-on-the-Clyde. By devoting his spare hours to study he obtained a Senior Honors Medal in Naval Architecture from the Government Department of Science and Art and subsequently became chief draughtsman in one of the smaller Clyde shipyards.

Resident in Germany from 1895-7, he was employed on battleship and steamer work with Messrs. Schichan, of Dantzic, and part of that time had charge of the arrangement plans of a N. D. L. steamer of 12,000 tons. Proceeding to India he managed a repairing and docking business on the Hooghly for some years, returning to England and starting business for himself as a naval architect in London in 1903.

He immediately turned his attention to motor boat designing, then still in its infancy, and has since turned out a large and increasing amount of first-class work in this line.

James A. Smith, M.I.N.A.

"I have been in the motor boat line since 1904," said Mr. Smith recently to a representative of MOTOR BOATING. "I built the 30-foot Quicksilver in that year. She was fast for the time and did 19½ knots with a 50 h.p. Daimler motor. She was a very successful little boat and was built on the Saunders system, her hull being sewn together with wire, like the Duke of Westminster's Wolseley-Siddeley, which was a marvel of that construction, still is, in fact, for she is racing this season under the name of the "Ursula," and should beat her own records so far as I can hear.

"My next boat was the Takumono, a racer on the yacht's Lauch type, and after her came the C. G. V., with a C. G. V. motor of 130 h.p. She was a 12 metre boat and was built for the Marquis de Jessé, a well known French sportsman. Then came a number of others, among which I may pick out the two Fleurettes, No. I built in 1906, engined at 20 h.p. and giving 13½ knots, and No. II, a favorite of mine, 25 feet by 5 feet, 51 h.p., which gave a speed of 19 knots. Both were built to the order of one of our best motor boating sportsmen, Mr. O. B. Colls.

"Others were Mr. Scott Hayward's Irish Adamate, Mr. Bestick's Arab, and Mr. Warwick Wright's Sea Dog, boats of 25 to 28 feet in length and fitted with 50 to 60 h.p. motors.

"I liked the Acushla best of my lower powered boats; she won 10 firsts, 3 seconds and 4 thirds in her first season in Irish waters, and I attribute a lot of her success to her owner, Mr. Scott Hayward, of Belfast.

"The development of the power boat has been rapid and the end is by no means in sight. When I went into the business the public, the owners, everybody, in fact, were afraid of the motor boat. The two elements, the motor and the hull, were such entire strangers to each other that a successful combination was looked upon as a marvel. Six years ago the limit was about 19 knots. It is now 33, and we have not reached the ultimate limit or near it. Within a couple of years or less we should do 40 knots. Of course the form of hull is still experimental, though already materials and workmanship are both so good that there is little room for improvement there.

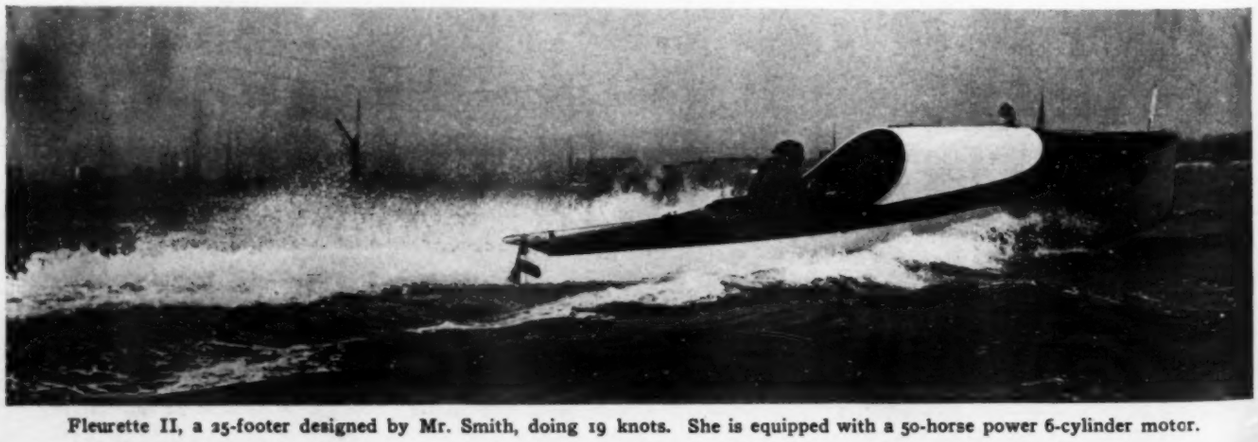
"The motor is the trouble. Engineers do not quite realize how important weight and space are to the hull designer. Every ounce of extra weight in the power plant must be paid for in displacement and every cubic inch of space is equally valuable; there is no way of giving an inch here or a foot there in motor boating without altering the whole and introducing an entire new set of conditions.

"Our difficulties in the early days were great," Mr. Smith continued. "The number of owners or mechanics either who understood the motor at all, back in 1903, and even up to three years ago, was very small. Numbers of good motors were discarded and scrapped for no reason except that nobody understood them. The propeller question was settled by rule of thumb, there were constant troubles over the pump circulation and in other ways. All that has been changed now. We have plenty of mechanics who are specialists on this job, we get the best out of our propellers—the whole combination is in fact entirely altered and improved.

"And the reason? Racing, racing, first and last. It has done for motor boating exactly what it did for the automobile. But for racing and the exigencies it demanded in every particular, the whole of the marine motor industry would have been full five years behind what it is today. You see, you must get the public and the owner interested. Racing first drew attention to the capabilities of the new craft, but people took an incredible lot of convincing. Capital had to be brought into the business and capitalists—I don't blame them for it—took time in weighing up the pros and cons of steam, petrol or kerosene motors.

"And is the petrol motor on top? For all fast and medium work, yes. Nor has it reached its limit of utility, either.. Speed will still rise and another big advance will take place when we get our power, as we very

(*Continued on page 50.*)



Fleurette II, a 25-footer designed by Mr. Smith, doing 19 knots. She is equipped with a 50-horse power 6-cylinder motor.

The One Hundred Dollar Motor Boat.

The First Instalment of the Series "How Much Does a Motor Boat Cost?" Boats Built or Bought for $100 or Less. The Engines for Them.

This is the first instalment of the big series which we announced first in the March issue of Motor Boating *and to which we again called attention in the April issue. In this issue we take up those motor boats which can be had, either through purchase complete or through building from parts obtainable in the market, for $100 or less, and the motors which would likely be used in such boats.*

It should be kept in mind that this is only the first instalment of the series which will run through twelve issues and take in all types and classes of boats and engines up to the $100,000 cruiser and the power plant that would be found in her. Next month we shall take up the $200 boat and its motor.

We want the owners of motor boats and we want the trade—the manufacturers of complete motor boats and the makers of engines—who read this note to send us at once descriptions and photographs of the boats they own or make or of the engines in their line, to be included in this series, and we want them to send us this material NOW. The compilation of this series is a colossal task and we shall appreciate all the help we can get in preparing it, and that help will come through sending us now the matter to be used in any part of the series.

Mr. Owner, we invite you to tell our other readers how you obtained motor boat satisfaction, what you got for your money and what you will get when you buy again. Send us a photograph of your boat, a description of her and tell us how much she cost.

Mr. Manufacturer, this is to be a comprehensive series, we want your product represented in it, for our readers want to know about it. We invite you again to send us the material—descriptions and photographs covering your entire line—for which we have already asked you here and by letter. We want every one, advertiser and non-advertiser, included.

Next month we take up the $200 boat and motor. If your boat is in this class send us photograph and description immediately.—Editor.

A Converted Dory.

THE question of "How Much Does a Motor Boat Cost", recalls to mind an experience I had two years ago in selecting and fitting up a boat for a friend of mine. This man was a great admirer of motor boating, and he was always lamenting the fact that he could not afford to own a boat of his own. He was continually figuring and scheming how much this and that kind of a boat would cost and like a great many others could not realize that there are more ways than one of securing one.

One day while we were discussing the cost of different motor boats also the merits of different models, I asked him if it would be possible for him to invest one hundred dollars in a boat and when he replied, "why certainly", I told him to come and see me some day and I would see what I could do. A few days later he called and we began figuring up just what could be done with a hundred dollars. A trip to New York found us in the possession of an 18 ft. dory, which is really a 20½ ft. boat as all dories are measured on the bottom, and a 3-horse Mianus engine which we purchased from a dealer who had taken it in exchange for a larger one. The dory cost $30 and the engine complete including propeller, shaft, stuffing box, coil and enough piping to connect up the pump, $40.

As it was just about high water we launched the boat and putting the engine aboard started for Staten Island where we were to do the work. After a good stiff row we landed there and having hauled her out figured up what we needed to complete the work. At a neighboring saw mill we obtained enough lumber to make the engine bed and to deck her over for three feet fore and aft, and a shaft log already bored, all for $2. A friendly plumber supplied the gasoline tank which held 10 gallons, and the piping for $4, and another $4 went to a blacksmith for the rudder and skeg, or shoe, and 50 cents for galvanizing both.

In two days we had all this installed and were all but ready to make the trial trip when a motor boat friend, who was posted, suggested that we had better put all the equipment required by law aboard before we ventured out, as the inspectors were very much "on the job", and it would save us the inconvenience of having them call us down for not complying with the law. This meant another trip to New York and as my desire was to keep within the stated sum it was necessary to forego the thought of brass and buy galvanized fittings whenever possible. A side steering wheel cost $2.50 and a pair of side lights and a head light took $5 more. Six dry cells meant the outlay of $1.50 and $2 went for a fog bell that will probably never be used. A pump whistle was purchased for $4.50 and three life preservers meant $2.25. Twenty feet of steering gear cable, three blocks and two fair leaders for $1.50 completed our purchases and I was glad to get out of the store as the rest of the $100 was fast being consumed.

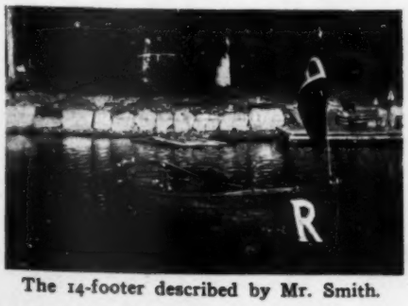
Staggering down Park Row people must have thought we were going to fit out some battle ship instead of a little 20 foot boat. However as long as we have laws they must be respected and when we reached Staten Island we began to wonder where we could put all our purchases. Another day was spent in installing all this gear and the next morning we tuned up the engine and started on a trial spin. Everything worked to perfection and after an hour's sail we returned to the float and found we had forgotten one item—a bilge pump—which meant another $1.50.

Summing up all these items it will be found that the complete boat and outfit cost only $99.75. Some time later we put on a spray hood and made a sectional hatch for the engine but this could not be added to the actual cost as they were not an absolute necessity.

This little craft has proven herself an admirable little cruiser and the limits of her ability are beyond reason. As an instance of what she is capable of doing, her owner cruised for a month in her last summer in the Chesapeake, and as it was impossible for the party of three to sleep comfortably aboard they carried a tent and camped ashore at night, and not only enjoyed the pleasures of cruising, but also the joys of camping.

This boat was of course fitted up as cheaply as possible, and while without luxuries she was all that was required and showed just how cheap a serviceable boat could be obtained for. Some readers may think that the engine and hull were secured at an exceptionally low price and while probably they were, but there are many more just such bargains to be had every day and since then I have seen many good dory hulls for sale for at least half this sum, while most of the houses handling engines have bargains similar to this every day in the week.

Ewing A. Crawford, Newark, N. J.



The 14-footer described by Mr. Smith.

A 14-Footer for $80.

FOR many years it had been a great ambition of mine to be the proud possessor of a power boat. Naturally, my desires were very modest, in fact, a motor in a flat bottom row-boat seemed about the limit of my financial capacity, but with further investigation my desires grew. Especially ambitious was the young lady who expected to operate the craft when I was busy in the city, and aided by her encouragement and my own wishes, at last we decided upon a real stylish outfit, a round bottomed boat.

Of course, the question of cost entered largely into consideration and I finally centered upon a Brooks Model of a round bottom row boat, that could be built easily (so the catalogue averred) by a boy of twelve years. Being nearly 22 years I figured out that I could build it in half the time.

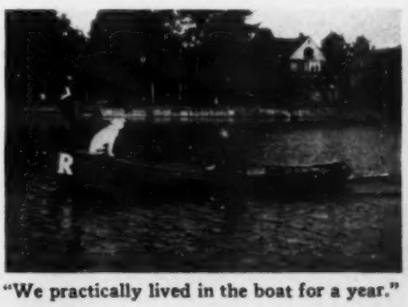
To cut the story of construction short, after many days of Sunday work, many hours of night work, aided by a couple of the boys, the work shop was adorned with a hull that certainly looked good to me. (Incidentally, I might say, that having power, I had rigged up a little circular saw that was a great aid in sawing out the planks, for in the small models the Brooks people do not send the planking cut to shape, and that is a good part of the job.)

For the power, after much catalogue perusing, I had ordered a little 1½ H.P. motor from the Detroit Engine & Manufacturing Co. of Detroit. (This engine is now sold by the Strelinger Engine Co. of Detroit, I believe.) The engine installation was comparatively easy and in a few days the "R" was launched. A couple of days more and the leaks stopped up pretty well, the engine seemed to stretch out and we were ready to tackle the 50 mile trip up the Susquehanna River, to Tunkhannock, thence to Lake Carey.

That we enjoyed that boat ever since, would be putting it mildly, all of us nearly lived in it, and the following year, with a new coat of paint, the addition of a slightly larger propeller, and the installation of a home-made under-water exhaust, we had as nice a little boat as one could wish for. She was quiet, reliable, safe, and attained a speed of over 5½ miles an hour.

This last fall after three years' use, I sold her for $60. The specifications and cost are about as follows: 14 ft. long, and 3 ft. 9" beam. (With this beam it was very steady, and would support a person standing on the gunwale.) The engine was of 1½ H.P. The knocked down boat complete cost about $22. The engine complete with equipment, $46. Paint and details, $10. Eighty dollars would therefore cover the total cost.

G. Earl Smith, Wilkes-Barre, Pa.



"We practically lived in the boat for a year."

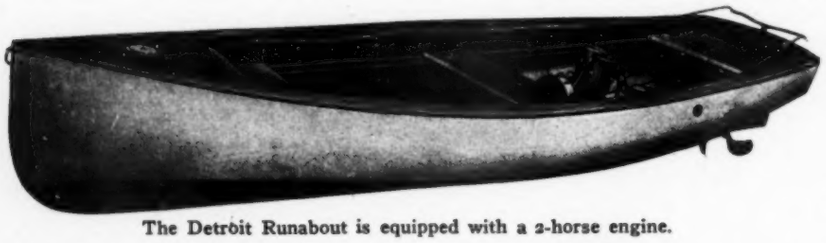
Three views of the home made V-bottom boat designed and built by Mr. Wyatt.

The 14-Foot Detroit Family Runabout.

A BOAT well adapted for fishing and general service and as a tender for larger boats is sold completely equipped by the Detroit Boat Company, Detroit, Michigan, for $94.50. The boat is 14 feet long with 4 feet 2 inch beam, and draft of 13 inches. It is equipped with the regular 2 horsepower, single cylinder, reversible Detroit engine and has an approximate speed of 6½ miles per hour.

On small inland lakes this type of boat is rapidly replacing the rowboat, as it has all of the advantages of the latter and its cost of operation will hardly amount to 15 cents a day. Its shallow draft, wide range of speed and muffled exhaust make it particularly adapted for fishing, trolling, and general family use.

During the past 12 months this company has delivered 664 of these boats and reports that from very few has there been the slightest complaint.



The Detroit Runabout is equipped with a 2-horse engine.

A Speedy 18-Footer of Simple Construction.

IF a boatman wishes to obtain the best boat that $100 will buy, it is advisable for him to undertake the construction of the boat himself, for it is really not such a difficult job as some people think.

As most all boatmen are interested in speed boats, and it is clearly impossible to build a cruiser for $100, it may not be amiss to attempt to describe a small racer that can be built for $100, and at the same time will give the owner as much real pleasure as the owners of famous speed boats get out of their flyers.

The boat is built in much the same manner as a canoe, but is much stronger and of course is shaped to follow the usual speed boat practice. There are five bulkheads, spaced 3' that are made of ½" cedar and securely fastened to an oak keel 4" wide and ⅝" thick. After the bulkheads are set up, four stringers ¾"x ⅜" are run on each side and screwed to the bulkheads. Strips of 3"x3/16" cedar are then bent around the hull from sheer to sheer, these are spaced on 6" centers and act as timbers. The boat is then roughly planked with 3/16" cedar or spruce in the same manner that a canoe is planked, the fastenings being copper tacks. Canvas is then tightly stretched over the hull and decks and the edges covered with mouldings.

The engine is a single cylinder outfit such as can be purchased for $60 complete, and is installed under a removable hatch just forward of the cockpit with controls brought aft to a steering wheel placed on the inside of the coaming. The helmsman can either sit on a camp stool or a wide seat built in the after end of the cockpit with the front of the seat resting on No. 4 bulkhead which can be cut off about 6" below the top of the coaming so as to drop the seat down in the cockpit.

The decks are of 3/16" cedar or spruce and are constructed the same as the hull proper, and are canvas covered and painted.

A ventilator is installed on the engine hatch or just forward of the hatch, in which case No. 2 bulkhead will have to have an opening cut in it to allow the air to reach the engine compartment. The bulkhead at the after end of the engine compartment should have the top left open to allow a view of the engine being seen without opening the hatch, and also to allow the escape of fumes, etc.

The fittings should all be of galvanized iron, as otherwise the hull will cost over $100, and if the fittings are painted they will be as pleasing to the eye as a brass fitting and it won't require a lot of work to keep them bright.

A boat of this kind ought to make a speed of 10 miles an hour with a 3 H.P. outfit that doesn't weigh over 110 pounds complete. An engine whose maximum speed is between 800 and 1000 R. P. M. is the most suitable for a boat of this kind, and if properly installed in a well built boat should prove as serviceable a little outfit as anything of its size and power.

If a three horsepower engine is used, with a normal speed of 800 r.p.m., either a two-bladed propeller 12 inches in diameter and of 15 in. pitch or a three-bladed one of 12 in. pitch and 12 inches in diameter should be used.

A Home Made and Designed "V-Bottom."

WHEN with much trepidation I decided to build a motor boat, eighteen feet sounded pretty big and four feet, eight inches a good beam, and as I had had no experience in boat building and knew nothing of steam bending, the V-bottom type appealed to me strongly. After much figuring, my wife and I concluded that $100 was about the figure we could spare, and having decided to do the best we could for this amount rather than wait until the next year and build a larger boat, we began to lay our plans.

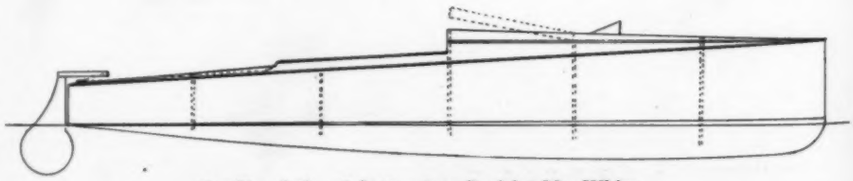
As it was then January, the cellar looked good to us as a place to build, but a few minutes with a tape line soon showed us that the $100 appropriation would be used up in lengthening the cellar and making changes in the foundation, so there was nothing left for it but the open air.

We were living at the time in Winthrop, Mass., and the January air at that place is somewhat brisk for boat building, but having decided to build a boat we were going to do it and so, after a week or so spent in designing the boat, and after many trips with the drawings to a naval architect friend, we at last made a paper pattern of the keel and sent it to the mill to be cut out. When it arrived a few days later, we set it up on saw horses in the yard and then went in to get warm.

I found by wearing a heavy suit of overalls over my clothes, two sweaters and an ear cap that I could work for about two hours without freezing. I don't know exactly what my wife wore, but she never complained of the cold.

It is unnecessary to give a description of the boat building, but it took considerable courage to get up from the supper table in a warm room, climb into a suit like a football player and go out to work in the cold where the wind never blew less than seventy miles an hour (it seemed). Of course it was dark but a couple of electric lights hung on the moulds and wired from the house took care of that part of our trouble. When the days grew longer we could get up at 6 A. M. and work an hour in the morning before I went to the office. It was strenuous boat building, but I was going to build a boat, and I did.

I give below a table showing the cost of the various materials used. The labor was performed by my wife and myself neither of whom had any knowledge of carpentry, al-



Profile of the 18-footer described by Mr. White.

though we of course had in the house such tools as "hammer, saw, screwdriver, etc."

When completed the boat was used mostly as a ferry between my home in Winthrop and one of the public landings in Boston, a distance of about four and one-half miles, the running time averaging about thirty-five minutes, so you see we made about seven and one-half miles per hour.

Oak keel and stem (including working at mill)	$4.80
Oak Ribs—cut 1"x1½"	2.40
Oak Top strake transom and coaming	4.50
Cedar for planking—200 feet planed ⅝"	14.00
Pine for flooring and seats	2.46
Canvas for decks	1.50

Papoose is equipped with a Wright motor.

Steering wheel	1.50
Rudder (made of iron and galvanized)	3.00
Galvanized nails and screws for fastening	.84
Galvanized cylindrical gasoline tank—15 gallons	3.00
Piping on gasoline and exhaust	1.70
Miscellaneous hardware, chocks, cleats, pulleys, etc	3.00
Paint and varnish	3.50
5 boat builders' clamps	1.25
Engine—second-hand 4 H.P. Atlantic with outfit	50.00
Total cost	$97.45

T. H. WYATT, Boston, Mass.

A V-Bottom 15-Footer.

THE accompanying design is of a 15-footer of the V-bottom type for which all the building materials and the motor may be purchased for a sum not to exceed $100. The design is by William H, Hand, Jr., of New Bedford, Massachusetts, who sells the complete working plans, detailed specifications and building directions for $5. Mr. Hand also supplies knock-down frames or even the completed hulls if desired.

The boat is 15 feet long, 4 feet 2 inches beam and 14 inches draft, and, equipped with a 3 horsepower motor, will do about 8 miles per hour. Mr. Hand has been experimenting with the V-bottom type of boat in a number of models for the last several years and recommends the result of his experiments to all those wanting a highly efficient little motor boat at small cost.

In action the V-bottom boat is quite the equal of any other type; it is stiff and steady, quite seaworthy and attains remarkable speed, on low power. The latter quality is accounted for in that the hull tends to slide over the water; but unlike other boats with flatter floors, there is very little tendency to pound.

The construction is extremely simple, so simple in fact that the average amateur builder has very little difficulty in following the instructions. The main framing runs fore and aft and averages about nine parts to each boat. The bottom planking is run crossways, much in the same manner as the planking on small flat bottom boats. The side planking consists of one board on each side running fore and aft. There are no frames to bend, no long planking strakes to fit and no difficult or special skill work in any part of the construction.

This type of construction is not new and is in no way an experiment. Boats have been built on this idea for a number of years, but Mr. Hand has merely refined and improved it and adapted it to motor boat conditions.

Papoose, a 16-Footer.

PAPOOSE was built by R. W. Ford, of Bridgeburg, Ontario, Canada. She is a 16-foot compromise launch of 4 feet 8 inches beam and is equipped with a 2½ horsepower, single cylinder Wright motor of 3 inch bore and 3 inch stroke, built by the Wright Motor Works, of Buffalo, with which power she does 7 miles per hour. The cost of the boat complete, including the engine, was $100.

The Pierce 14-Foot Dory.

THE Pierce Motor Company, of Racine, Wisconsin, are turning out a 14-foot dory of 4 feet beam, 10 inches draft and with a capacity of five persons, complete for $90. The keel, stern post and stem of this boat, as well as the ribs are of northern white oak and the latter with the exception of a few in the bow, run in continuous pieces from side to side. Louisiana cypress planking is used and the boat is built after the clinker style.

The engine is the regular 1½ horse power, 3 inch by 3 inch reversing model built by the same company and a description of which may be found in the list of motors for $100 boats. This power equipment gives the boat a speed of 7 miles per hour with a radius of 70 miles.

The gunwales, strakes and deck are finished in natural wood with four coats of marine varnish. The outside of the boat is painted a lead gray and the inside a dead grass color. The equipment furnished includes a set of cushions and the boat is especially designed for hunting and fishing. The complete outfit weighs 415 pounds and sells for $90 with fresh water fittings and for $100 when salt water fittings are required.

Michigan Gives Good Service.

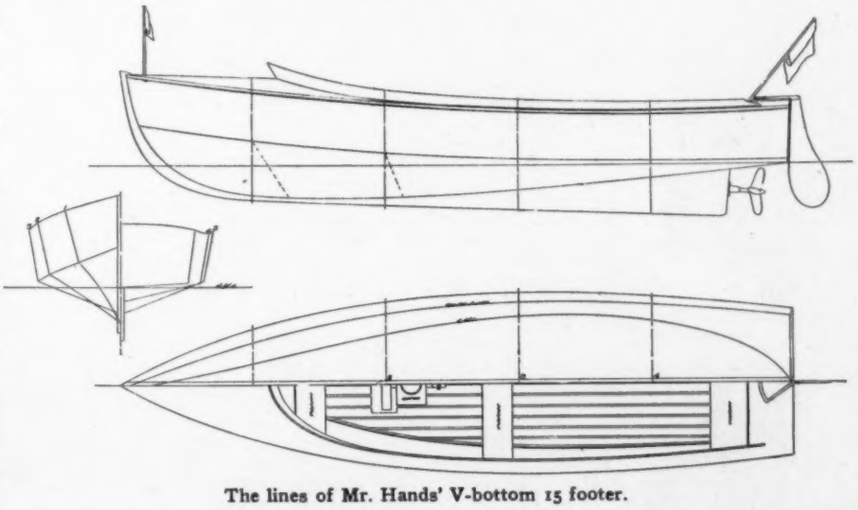
LAST season I purchased a small launch which fits very nicely into the first installment of the Motor Boat Cost Series. In hopes that someone who has had experience with a larger boat will in turn give me the benefit of it, I will say that the boat in question is a 16 foot launch of 53 inch beam, very flat on the bottom, giving a good carrying capacity and still not detracting from its seaworthiness. The boat was not built especially for me but is a regular stock model built by the Michigan Steel Boat Company, of this city. It is equipped with a 2 horsepower, 2-cycle reversible Detroit engine and cost complete in running order $96. The engine is located in the after part of the boat, allowing the occupant to sit forward, thereby giving a larger seating accommodation than would otherwise be the case. I am able to get an average speed of 7 miles an hour in ordinary weather. I used this boat continuously all last season and the engine ran like a clock and did not give me a moment's trouble from the time I purchased the launch until I laid her up last fall.

L. L. PLACE, Detroit, Mich.

The Waterman With Outboard Motor.

IN the illustration below is shown one of the Waterman rowboats equipped with the outboard motor also manufactured by this company. The boat recommended for use in this connection, may be had in either 14 or 16 foot lengths and sells for $35.00, which, with the motor, which costs complete, ready to install, $65.00, brings the cost of the complete boat to $100.00. It is surprising what speed may be obtained with such an outfit. The company cites many cases where their motor has been applied to all sorts of small boats and in a number of cases a speed as high as 9 miles has been obtained. The motor is clamped to the transom and serves the double purpose of propelling and steering the boat. The gasoline tank is carried upon the tiller and there is no permanent connection between the engine and boat, so that it may be used as motor boat, rowboat or sailboat at a moment's notice.

The Waterman, a good all round outfit.

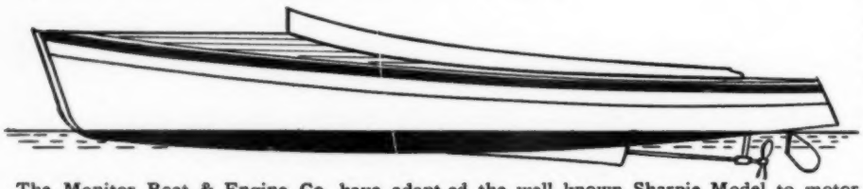


The lines of Mr. Hands' V-bottom 15 footer.

The Sharpie Motor Boat.

THE Monitor Boat and Engine Company, of Newark, N. J., who manufacture a line of knock-down frames for boats ranging in size from the small power tender up to the 50-foot cabin cruiser have added to their line of round bilge or round bottom boats a model for use with gasoline motor, built on the Sharpie type, which was developed so successfully several years ago for sailing craft.

This type of boat is unquestionably one of the easiest and cheapest to construct, and for small lake and river use it is an able, comfortable and safe boat. The materials furnished cover everything machined and fitted necessary for the construction of the hull, including planking, ribs, decks, floor, transom, stem, etc., and it is claimed that the amateur can put the hull together in a few days. By using the material supplied by this company, it is easily possible to construct a 20-foot Sharpie of four feet, eight inches beam for $55, which leaves a remainder of $45 for the power equipment. There are a number of motors on the market ranging in power from 1½ to 3 horsepower that are suitable for this hull and that may be bought within the figure mentioned.



The Monitor Boat & Engine Co. have adapt ed the well known Sharpie Model to motor boating conditions.

The Gere method of easy boat building as used by the Monitor Company insures the lowest cost of construction, as the system has been worked out so that there is the least possible waste of material and time.

A 16-Foot Steel Launch.

THE accompanying illustration shows a 16-foot steel launch which is sold by the Michigan Steel Boat Company, of Detroit, Michigan, completely equipped for $96. The hull is constructed of heavily galvanized rolled steel, which is cut in regular pattern shape, with locked seams and welded together by pneumatic hammers. There are heavy oak sheer strikes and the interior, decks, etc., are finished bright. Every boat is fitted with air-tight compartments sufficient to float it and its passengers if she should become filled with water.

This model will seat comfortably seven persons and is fitted with a 2 horsepower Detroit 2-cycle reversible engine, which propels it anywhere from one to seven miles per hour.

The dimensions of the boat are: Length, 16 feet; beam, 4 feet 2 inches and draft 12 inches. The net weight is 550 pounds. Every boat is thoroughly tested before leaving the factory to insure its perfect operation.

The 16-foot Michigan is equipped with a 2 horse motor and will seat 7 persons.

Motors for $100 Motor Boats.

This is the first instalment of motors in the series "How Much Does a Motor Boat Cost?" We have selected those motors which sell at such prices that they could be used in motor boats which would cost no more than $100 complete. We have endeavored to include all motors in this class offered on the market. The series will run through twelve issues and we shall take up, as we do here, all motors made, including those which are used in the largest boats. Manufacturers are urged to co-operate with us by supplying us with photographs, specifications and prices (net to retail purchasers) of their complete lines so that this motor series may be representative of the entire trade and therefore of the greatest possible value to the motor boatman and prospective motor boatman.

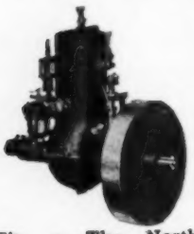


Fig. 1.—The Northwestern Two-Horse.

A 2 Horse Power High Speed Reversing Engine (Fig. 1).—Northwestern Steel and Iron Works, Eau Claire, Wisconsin. This motor has already proved its worth as there are a great number of them in use and giving perfect satisfaction. They have been used extensively in the United States government light house tenders, and in the Chicago Police Boat Service. The 2 horse power model is in every way the equal of the larger models and is strong, very simple in operation, and is reversible. The equipment, including propeller shaft, stern bearing, stuffing box, wiring, muffler, etc., complete, sells for $40.

Fig. 2.—Dunn Four Cycle Reversible.

The Dunn 4-Cycle Reversible Outfit (Fig. 2).—Walter E. Dunn, Ogdensburg, New York. This motor is rated at 1¾ horse power and is exceptional in that it is of the 4 cycle type. It is made by a company that has had considerable experience in the construction of larger 4 cycle motors and its design is exceedingly simple. It has the straight line, valve motion, pump below the water line, cam and commutator capable of reversing the motor, and adjusting the spark while running in either direction. The motor has a stroke of 4 inches and bore of 3¾ inches and the outfit consisting of motor, coil, batteries, shaft, muffler, etc., sells for $42.50. The engine only is sold for $33.

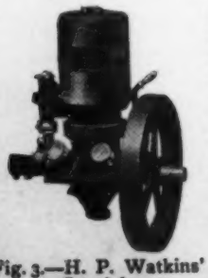


Fig. 3.—H. P. Watkins' Special.

3 Horse Power Watkins Special (Fig. 3).—The Watkins Motor Company, 523-529 Baymiller Street, Cincinnati, Ohio. The motor shown herewith is of the 3 port, 2 cycle type, the bore being 3 inches and the stroke 3 inches. The base is of the very best grade of aluminum. The water jacket is of spun copper and these two features have brought the weight down to 30 pounds. The motor with water pump, coupling, oil and grease cups and starting crank sells for $45 and this outfit with five dry cells, wire, switch, muffler, five feet of shaft, propeller, stuffing box, two gallon tank, carbureter, spark coil and plug, oil can and wrench is sold for $65 with $4 additional for salt water fittings.

The 3½ Horse Power Fox (Fig. 4).—The Dean Manufacturing Company, 262 Front Street, Newport, Ky. This is the smallest engine of the complete line manufactured by this company. It has two special features, the Fox Fourth Port Accelerator and the Fox Carbureter. The former is a newly patented device which produces a perfect mixture, increases the power and reduces fuel consumption to a great extent. The latter is mechanically correct both for high and low speeds, has no springs and having all working parts and areas accurately machined. The small single cylinder model is sold on thirty days' trial, and with a year's guarantee for $55.

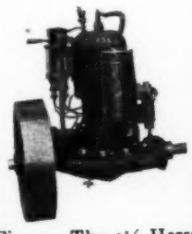


Fig. 4.—The 3½ Horse Fox.

The 2-2½ Horse Power Belle Isle (Fig. 5).—The New Belle Isle Motor Company, Detroit, Michigan. This little engine is exceptional in that there is not a single gear, valve, push rod or spring used in its construction. The pump and commutator are of a special design used only on the Belle Isle engines, both parts being actuated by a single eccentric. The carbureter is of the regular automobile type, furnished by the Buffalo Carbureter Company of Detroit, and all the rest of the equipment is the best procurable. The engine alone sells for $23 and with complete fresh water fittings the cost is $42, $4 extra being charged for salt water fittings.

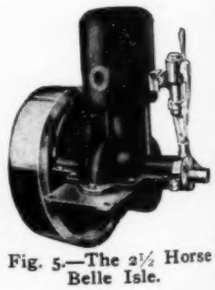


Fig. 5.—The 2½ Horse Belle Isle.

Pierce Reversing Motors (Fig. 6).—Pierce Motor Company, Racine, Wisconsin. Shown herewith is the single cylinder reversing motor with which the Pierce boats are equipped. A Schebler carbureter is used on all models. The 1½ horse power model has a bore of 3 inches and a stroke of 3 inches, runs normally at 750 R. P. M. and weighs 75 pounds net. The 2 horse power model has a bore of 3½ inches and a stroke of 3½ inches, runs at 650 R. P. M. and weighs net 125 pounds. The equipment includes a spark coil, dry cells, high and low tension wire, spark plug, switch, starting crank, coupling, five feet of shafting, stuffing box and propeller. The 1½ horse motor sells for $51.75 and the 2 horse for $54 complete.

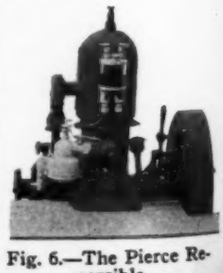


Fig. 6.—The Pierce Reversible.

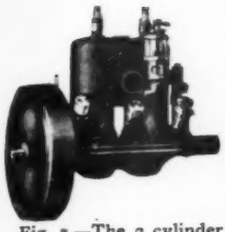


Fig. 7.—The 2 cylinder Cox.

The Cox Reversible Double Cylinder (Fig. 7).—Wilcox and Carlson Company, Detroit, Michigan. While this company manufactures larger sizes of 2 cylinder engines, they specialize in the little fellow shown in the accompanying illustration. The cylinders are cast en bloc and are of 2¼ inch bore by 2½ inch stroke. The entire weight is only 64 pounds and it is therefore especially adapted for canoes, rowboats, etc. The motor, including commutator, brass circulating pump, lubricator, relief cocks, grease cups and starting crank, sells for $35, and with float feed carbureter, spark coil, spark plugs, four dry cells, switch, rubber covered insulated wire, Yankee expansion silencer, a 10 inch, 2 bladed propeller, stuffing box, thrust bearing and lag screws the cost is $55 with $4 additional for salt water fittings.

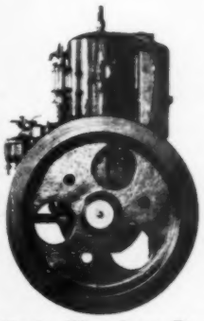


Fig. 8.—The 2 horse Detroit.

The 2 Horse Power Detroit (Fig. 8).—Detroit Engine Works, Detroit, Michigan. The motor shown in the accompanying illustration is the smallest of this company's product, which ranges from 2 to 20 horse power. It is of the 2 port, 2 cycle type, having but 3 fundamental moving parts. The bore is 3 inches and the stroke 3½ inches and the power rating is taken at 600 R. P. M. The ignition is of the jump spark type and lubrication is accomplished by a centrifugal ring oiler. The engine alone is sold for $29.50 and with complete equipment it is listed at $67.50 from which however a liberal discount is allowed.

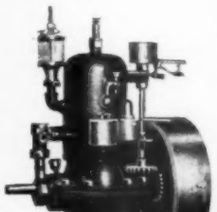


Fig. 9.—Victor Horse and a Half.

The Victor Horse and a Half (Fig. 9).—Robert S. Hill, 23 East Woodbridge Street, Detroit, Michigan. This is a 2 cycle, reversible motor with a bore of 3 inches and stroke of 2½ inches. It has a one inch drop forged shaft with center oiler and extra large grooves to prevent blowing from case. It has a bronze piston pump and rotary commutator speed control as shown in the illustration. It will turn a 10 inch propeller 850 R. P. M. The price of the bare motor with commutator, pump and relief cock is $32.75; with electrical and boat fittings $48.50 and equipped with bronze salt water fittings $54.50.

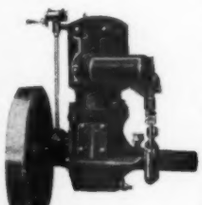


Fig. 10.—The 2 Horse Perfection.

The 2 Horse Perfection (Fig. 10).—Caille Perfection Motor Company, Detroit, Michigan. This is a 2 cycle motor of 3 inch bore and 3½ inch stroke, weighing complete 100 pounds. It will work satisfactorily on from 100 to 800 revolutions per minute, turning a propeller 11 inches in diameter and of 18 inch pitch. The engine with all its fittings sells for $40 and with complete boat equipment ready to install the price is $48 or $51 when equipped for salt water. With a reversible propeller the price is $62 and with reversing gear $63.

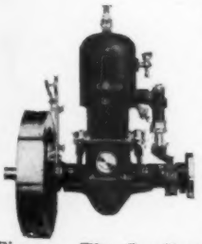


Fig. 11.—The Smallest Lockwood-Ash.

The 2½-3 Horse L-A Motor (Fig. 11).—Lockwood-Ash Motor Company, Jackson, Michigan. The L-A motor shown herewith is of the single cylinder, 2 port, 2 cycle type with bore of 3¼ inches and stroke of 3½ inches, and as to quality is a small edition of the larger and more expensive engines manufactured by this company. The motor with shaft timer, combined pump eccentric and coupling, intake and exhaust manifolds and starting crank sells for $42.50, and completely equipped with all boat fittings and electrical appliances the price is $60.

Fig. 12.—Waterman Outboard Motor.

Waterman Porto Motor (Fig. 12).—The Waterman Marine Motor Company, Detroit, Michigan. The Porto or outboard motor shown in the illustration may be attached to any boat and will give a speed of from 4 to 9 miles per hour, depending upon the size, weight and lines of the boat. The cylinder has a bore of 2¾ inches and the stroke is 3 inches and the motor develops a full 2 horse power. The gasoline tank shown on the tiller holds one gallon, which is sufficient to cover 25 or 30 miles. The equipment includes a float feed carbureter and the outfit complete sells for $65. This company makes two other models of the usual type suitable for installing in the $100 boat, namely, the model A1 heavy duty 1½-2 horse power, which sells for $45 completely equipped, and the model K1 high speed 2 horse power which is sold for $60.

The Liberty Dwarf (Fig. 13).—Detroit Auto Specialty Company, 909 Greenwood Ave., Detroit, Michigan. This little motor is of the 2 cycle, 2 port type with a bore of 2½ inches and stroke of 2½ inches. It weighs complete 30 pounds and when turning at 900 R. P. M. develops 1 horse power. The water jacket is of cast bronze, highly polished and gives the motor a very fine appearance. The price of the motor alone is $52.50, and with complete equipment, consisting of 4 feet of ⅝ inch steel propeller shaft, bronze stuffing box, mica spark plug, 7 inch 3 blade propeller, spark coil, switch, dry cells and the necessary wire and lag screws the price is $60, with $3 additional for salt water equipment. The above company also turns out a 1½ horse power engine similar to the one just described, but with a bore of 3 inches and stroke of 2½ inches. This complete outfit weighs 50 pounds and sells for $60 with $4 additional for salt water equipment.

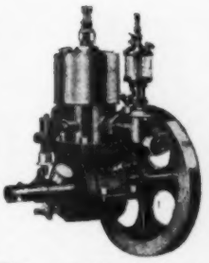


Fig. 13.—The Liberty Dwarf.

The Model A Grasser (Fig. 14).—Grasser Motor Company, 102-4 Ottawa Street, Toledo, Ohio. The 2-2½ horse power motor shown herewith is of the regular 2 cycle type of $3\text{-}^{1}/_{16}$ inch bore and $3\text{-}^{1}/_{16}$ inch stroke, and develops its rated horsepower on 700 R. P. M. The outfit complete consisting of 6 dry cells, coil, plug, primary and secondary wire, switch, coupling, muffler, tools and solid bronze propeller wheel with 6 feet of steel shaft and bronze stuffing box sells for $65.

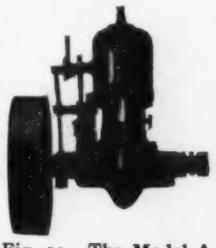


Fig. 14.—The Model A Grasser.

The Model O Roberts (Fig. 15).—The Roberts Motor Company, Sandusky, Ohio. The model O Roberts here shown has a bore of 3½ inches and a stroke of 3 inches, weighs 100 pounds and has a range of speed from 150 to 1200 R. P. M. although the normal speed is 900 R. P. M. at which speed the motor develops 3 horse power. The Roberts motors are absolutely guaranteed against back fire or base explosions. The standard equipment accompanying each engine, consists of a carbureter, pump, timer, lubricator, grease cups, ball thrust bearing, coupling, priming cups, full set of drain cocks and starting handle and the price with this equipment is $55.

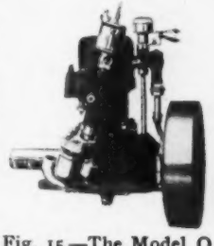


Fig. 15.—The Model O Roberts.

The Palmer B (Fig. 16).—Palmer Bros., Cos Cob, Conn. The motor shown in the accompanying illustration is of the 2 port, reversible type and uses the make and break system of ignition. The bore is 3½ inches and the stroke 3½ inches. The engine with muffler, carbureter, oil cups, and coupling sells for $60. The electrical equipment of two sets of cells, spark coil, switch and wire is $6; the boat equipment consisting of bronze propeller, shaft and stuffing box is $6; the piping, including that for water connection, gasoline and exhaust is $4 and the tank of 12 gallons capacity is $3, bringing the total for the entire equipment up to $79.

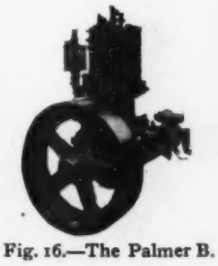


Fig. 16.—The Palmer B.

The Little Skipper (Fig. 17).—Monarch Tool Company, 16 Opera Place, Cincinnati, Ohio. This is the smallest model of the Little Skipper marine motors, which, until recently, have been manufactured by the Gray Hawley Manufacturing Company. The bore is 3¼ inches and the stroke 2¾ inches and although the speed range is from 250 to 1200 R. P. M. the rating of 2 horse power is taken at 700 R. P. M. An interesting fuel device with this engine is so constructed and located as to admit only air to the crank case, the fuel being vaporized above as the air passes from the crank case to the cylinder. The motor complete with fresh water equipment sells for $45 and equipped for salt water the price is $50.

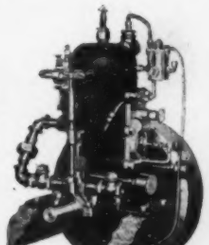


Fig. 17.—The Little Skipper.

The 2½ Horse Power Gile (Fig. 18).—Gile Boat and Engine Company, Ludington, Michigan. This motor, the smallest of the Gile product, is carefully built throughout as are all the larger models. The piston rings for instance, are made exceptionally heavy and after being cut are sprung to the exact bore of the cylinder and reground to insure their fitting properly and to avoid scoring the cylinder. This motor is positively reversible and will work equally well in either direction. The price of the motor with complete equipment ready to install in the boat is $55.

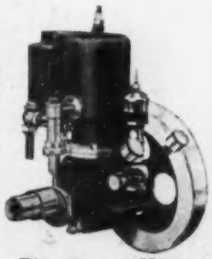


Fig. 18.—2½ Horse Gile.

Among the Clubs

The Larchmont Yacht Club in gala attire for one of its numerous water carnivals.

American Power Boat Association. The incorporation in the articles of association last year of the formation of local sections of this organization is proving to be a wise action and will without doubt be productive of excellent results. President Koerner has compared the formation of local sections with federal, state and municipal activities, the "municipal activity" representing the actual business and social life of each individual motor boat club; the "state activity" representing each individual club in a local section of five or more clubs; and the "federal activity" representing these local sections which, together with the officers of the parent organization, form the council of the American Power Boat Association. Each local section can elect its own officers, adopt its own distinguishing name and conduct its business in its own manner. Each section is composed of five or more clubs and the chairman of the section becomes a vice-president of the American Power Boat Association. A council of such representative men from every section of the country can use its collective power in the most efficient manner possible, and it is expected can speedily neutralize any detrimental efforts to the best interests of motor boating

The Great Lakes Power Boat Association, Buffalo, N. Y. The first meeting leading toward the organization of this club was held at the Power Boat and Sportsman's Show, and it is expected that the new association will include all prominent power boat clubs on the Great Lakes from the Thousand Islands to Buffalo and Duluth. Most of those present at the meeting, who represented a large proportion of the yacht clubs in that section of the country, were in favor of the organization and while it is not intended to antagonize any existing body it is thought that the time has now come when sailing and motor boating interests should be divided into separate classes. A resolution was adopted favoring the appointment of a committee to draft a constitution and bylaws and to call a meeting of the different motor boat clubs of the Great Lake district.

Lake Weir Yacht Club, East Lake Weir, Florida. This club, which has over half a hundred members and twenty-five launches in its fleet, recently elected the following officers for 1910: Commodore, W. R. Goodwin; vice-commodore, H. W. Henry; secretary, H. T. Connard; assistant secretary, E. J. Lytle; treasurer, Z. C. Chambliss.

Norwalk Yacht Club, South Norwalk, Conn. At the sixteenth annual meeting of this club officers were elected as follows for the ensuing year; Commodore, M. L. Allen, M. D.; vice-commodore, J. H. Bailey; rear-commodore, R. B. Budd; secretary, G. E. Curtis; assistant secretary and treasurer, R. G. Mitchell. The secretary reported the club to be in a very flourishing condition and a number of repairs are to be made to the club house and float during May in preparation for the season which will formally open on Memorial Day. The treasurer's report showed a balance of over $200, and it was voted to use $100 of this to reduce the debt on the club property.

Headquarters of the Toledo Yacht Club.

Bay Spring Yacht Club, Bay Spring, R. I. Although this club has been organized for only a year, plans have been completed for the erection of a club house and the extension of the club wharf during the spring. The club is situated at the mouth of Bullock's Cove which furnishes an excellent protection from storms. The following officers have been elected for 1910: President, John J. Bowden; commodore, C. C. Mackay; vice-commodore, Peter Johnson; rear-commodore, A. J. Webb; treasurer, E. E. Culver; secretary, Ernest Cordin; fleet surgeon, Dr. T. H. Bell; fleet captain, R. H. Brighton.

Corinthian Yacht Club, Yale University, New Haven, Conn. At the mid-winter meeting of this club the following officers were elected for 1910: Commodore, G. A. Richardson; vice-commodore, M. G. Ely; rear-commodore, L. Soule; treasurer, C. V. Hartley; secretary, H. L. R. Emmett; fleet captain, R. J. Carpenter. Plans were formulated for the coming spring season to greatly enlarge the club's usefulness by creating greater interest in racing. A number of improvements are being made at the club house which is situated at the south side of Morris Cove and a new float is being built. A special regatta will be held on Decoration Day open to all boats enrolled in the club.

Chesapeake Bay Yacht Racing Association, Baltimore, Md. This Association, which was formed last July and which is composed of seven clubs with a total membership of nearly 1,400 held a meeting in Baltimore recently and elected the following officers for the ensuing year: President, Commodore W. W. Grier; vice-president, Vice-Commodore T. C. Morris; secretary, Commodore J. H. Robinette. A number of races and cruises have been scheduled for the coming season and a regatta will be held from July 16 to 23, inclusive. Since this regatta will be open to members of any recognized club, it is expected that there will be a number of motor craft on hand from Philadelphia.

Buffalo Launch Club, Buffalo, N. Y. One of the principal nautical events of the season will be the annual three day carnival which will be held in September by this club. There will be motor boat races, in addition to many other events, and the Inter-Lake championship will be decided over 50, 25 and 10-mile courses. It is expected that boats will be entered from Cleveland, Detroit, New York, Canada and other points. In addition to this there will be races for cruisers and semi-speed boats, open races, reliability and endurance contests. This club is one of the pioneers among motor boat organizations and has a handsome club house on Grand Island facing the American bank of the river where the stream is several hundred feet in width. The club has a membership of over 400.

Motor Boat Club of America, New York City. The commodore of this club was recently authorized to appoint a committee of five to organize a syndicate to build a defender and to invite the motor boat committee of the Automobile Club of America to co-operate with the Motor Boat Club in perfecting arrangements for the International Race for the Harmsworth trophy It was unanimously decided again to hold the race over the Huntington Bay course on August 20. The following officers were elected: Commodore, H. L. Melville; vice-commodore, H. R. Sutphen; rear-commodore, James Craig; treasurer, Charles Francis; secretary, W. M. Bieling; board of governors, J. M. Shaw, C. P. Tower, E. J. Steiner, F. D. Gheen, J. H. Hoadley and M. M. Whitaker.

San Francisco Yacht Club, San Francisco, Cal. At the recent annual election of officers, the following were chosen for 1910: Commodore, J. R. Hanify; vice-commodore, L. T. Wagner; secretary, H. A. Russell; financial secretary, G. B. Dinsmore; treasurer, C. P. Nichols. The offices of port captain and measurer were made appointive.

Illinois Motor Boat Club, Chicago, Ill. The following officers have recently been elected: Commodore, O. N. Hanson; vice-commodore, P. D. Shilmire; rear-commodore, W. H. Abbe; secretary, L. V. Hanson; treasurer, Joseph Litchgi; fleet captain, Frank Healy; fleet surgeon, C. N. Stickney; chaplain, E. A. Bache.

Albany Yacht Club, Albany, N. Y. The following are the present officers of this organization: Commodore, Matt McCarty; vice-commodore, W. L. Martin; fleet captain, C. E. Butler; treasurer, F. A. Froelich; secretary, A. N. Barto.

Mystic Boat Club, Medford, Mass. This new club was recently launched with about 40 members and officers were elected as follows: Commodore, E. W. Farmer; vice-commodore, Thomas Doyle; fleet captain, Albert Glawson; secretary, W. A. Joyce; treasurer, Maurice Kearney.

Trenton Yacht Club, Trenton, N. J. Plans have been adopted for the erection of a new club house along the river bank at the north end of Riverview cemetery. It is expected that the house will be completed in a short time and the members of the club are planning to open it with a water carnival. Officers have been elected as follows: Commodore, W. H. Millburn; vice-commodore, George Kline; rear-commodore, Joseph Hart; recording secretary, Fred Epping; financial secretary, John Connors; treasurer, Charles McIntyre; sergeant-at-arms, James Farley; fleet captain, John Disbrow.

The Motor Boat Club of Buffalo, Buffalo, N. Y. The clubhouse of this organization is located upon a small island midway between Grand Island and Buffalo, which was long uninhabited but which has since been transformed into one of the beauty spots of that section and is now called Motor Island. The clubhouse, which was burned to the ground last fall just before completion, has been rebuilt and the club now occupies very handsome quarters An excellent racing course extends from just above Motor Island to a point about a mile below the Buffalo Launch Club and permanent anchors mark all the turns of the course, which is usually a double triangle, five miles in length. Fifty-five new members have been elected to membership within the last month and a total membership of the club now numbers over 400.

Toronto Motor Boat Club, Toronto, Ont., Canada. The following officers have been elected for 1910: Commodore, Arthur Blight; vice-commodore, F. R. Caldwell; secretary, C. R. Allison; treasurer, T. W. Rae.

Norristown Motor Boat Club, Norristown, Pa. This club was formed last month with the following officers for 1910: Commodore, T. J. Jamison; vice-commodore, Ralph Thomas; treasurer, William Schwartz; secretary, Oscar Carter. There are twenty-five charter members of the club, and from the enthusiasm shown its success is assured.

New Rochelle Yacht Club, New Rochelle, N. Y. B. R. Stoddard, the retiring commodore of this club, suggested at the recent annual dinner a plan which appeared to meet with the favor of all those present. The plan is to consolidate the three clubs having houses on New Rochelle Harbor, namely, the New Rochelle Yacht Club, the New Rochelle Rowing Club and the Huguenot Yacht Club. The following officers were elected for 1910: M. W. Houck, commodore; E. C. Myrick, vice-commodore; S. C. Hunter, rear-commodore; C. A. Marslin, secretary; C. E. Salter, treasurer; R. M. Haddock, measurer.

Southern Yacht Club, New Orleans, La. At a meeting of this club recently held, a report of the secretary showed 434 members in good standing, and the following officers were elected for 1910: Commodore, Albert Baldwin; vice-commodore, Ernest Jahncke; rear-commodore, C. A. Farwell; treasurer, J. J. Hooper; fleet surgeon, Dr. R. L. Riley; measurer, H. P. Johnson.

Harlem Yacht Club, New York. The following officers have been elected for the ensuing year: Commodore, W. S. Sullivan; vice-commodore, F. D. Newton; rear-commodore, W. J. Fowler; treasurer, E. J. Martin; secretary, Edward Schmidt; measurer, John Wimer; fleet surgeon, Dr. T. A. Martin. The annual regatta of the club will be held as usual upon May 30th, and the annual cruising race, which has been held for the past five years to Stratford Shoal and return, will take place in August. In addition to these events a series of handicap races will be held on Saturdays throughout the season.

Ocean City Motor Boat Club, Ocean City, N. J. Although this is a newly organized club, plans for a new house have been submitted, and the erection of a club house upon the property recently purchased by the club on the bay at Fifteenth Street has been approved. The house will be modern in every respect and will have a frontage of 70 feet on the bay front, with a depth of 84 feet. In addition to a billiard and pool room, the building will contain ten living rooms.

Green Bay Yacht Club, Green Bay, Wisconsin. Officers have been elected for 1910 as follows: President, R. B. Power; vice-president and vice-commodore, J. H. Golden; rear-commodore, Gus Walters; fleet captain, H. G. Backhausen; measurer, Myron Wing; calculator, E. G. Orbit; fleet captain, Dr. T. J. Oliver. Applications for membership of fifty-one persons were acted upon at the meeting, and it is thought that the present season will include a larger membership than ever before.

Illinois Valley Yacht Club, Peoria, Ill. Much interest is being taken in this neighborhood in the races of the Mississippi Valley Power Boat Association which are to be held from July 4th to 6th and the Western Power Boat Association, which are to be held on August 30th and 31st. It is fully expected that such speedy boats as Dixie II and the new Intruder will be sent over by their owner, Frederick K. Burnham of the Thousand Islands Yacht Club, and they will doubtless be raced against J. W. Whitlock's Hoosier Boy, W. J. Connor's Courier and a number of fast boats which are still under construction. More than $6,000 in prizes have already been offered and the races are attracting intense interest.

May 21: Havana Race.—Starts from Philadelphia and covers a distance of approximately 1300 miles. Opened to seaworthy boats of from 50 to 100 feet over all.

May 21-28: New York.—Motor Boat Show and Water Carnival held on pier and plaza at foot of 98th St., Hudson River.

May 30: Brooklyn, N. Y.—Annual regatta of Brooklyn Yacht Club.

May 30: McKeesport, Pa.—Regatta of McKeesport Launch Club.

June 18: Chicago to Michigan City.—Fifth annual race of Columbia Yacht Club.

June 19-21: Houston, Texas.—Fourth annual regatta of Houston Launch Club, open to all boats on the Gulf.

June 25: Bermuda Race.—Starts from lower New York Bay and is run under the auspices of the Motor Boat Club of America.

July 2: Brooklyn, N. Y.—Start of annual regatta held by the Brooklyn Yacht Club over the Cape May course.

July 2: Chicago to Muskegon, Mich.—Race for the Racine Cup, held by Columbia Yacht Club.

July 2: Sea Isle City, N. J.—Open regatta for all classes held by Sea Isle City Yacht Club.

July 2-5: Cleveland, O.—Annual regatta of Lakewood Yacht Club held on Lake Erie.

July 4-6: Mississippi Valley Power Boat Assn. Regatta.—Peoria, Ill. Held under the auspices of the Illinois Valley Yacht Club. William S. Kellogg, Jr., secretary racing committee.

July 4: Honolulu Race.—Starts from San Pedro, Cal., and is open to regular club boats under 80 feet L. W. L. Approximate distance, 2086 miles.

July 4-9: McKeesport, Pa.—Regatta of McKeesport Launch Club.

July 8: Atlantic City, N. J.—Start of annual ocean race held by the Yachtsmen's Club of Philadelphia over a 140 mile course.

July 9: Cleveland, Ohio.—Open regatta for championship of city of Cleveland, held by Cleveland Yacht Club.

July 16-19: Chicago to Charlevoix, Mich.—Relay Race held by Columbia Yacht Club.

July 16-23: Baltimore, Md.—Annual cruise and regatta of Chesapeake Bay Yacht Racing Association.

July 18-24: Put-in Bay, Ohio.—Annual regatta of Inter-Lake Yacht Racing Association of Lake Erie.

July 23-30: Brooklyn, N. Y.—Annual cruise of Brooklyn Yacht Club.

July 30: Holly Beach, N. J.—Annual race held by Holly Beach Yacht Club.

August 20: British International Race.—Run over the Huntington Bay course, Long Island Sound, for the Harmsworth trophy

August: Alaska-Seattle Race.—This race will probably start during the third week in August and will run from Juneau, Alaska, to Seattle, a distance of over 1000 miles.

August 27: Chicago to Peoria.—Start of cruise of Columbia Yacht Club of Chicago.

August 30-31: Western Power Boat Assn.—Second annual regatta held at Peoria, Ill.

September 5: Chicago, Ill.—Annual regatta of Calumet Power Boat Club under auspices of Western Power Boat Association.

September 5: Hudson River Yacht Racing Assn.—Annual regatta held at Ossining, New York.

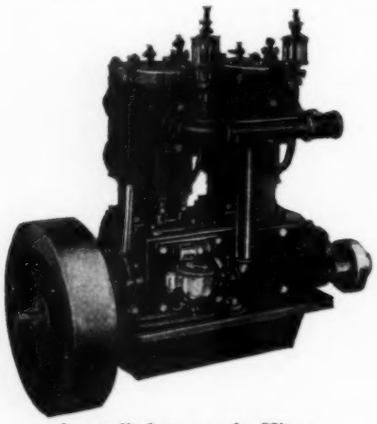
September 5: McKeesport, Pa.—Regatta held by McKeesport Launch Club.

October 8: McKeesport, Pa.—Regatta held by McKeesport Launch Club.

Motors for Motor Boats.

The Hines Model C.

The illustration herewith shows one of the Hines model C motors which are made in five, ten and twenty horse power sizes of 1, 2 and 4 cylinders, respectively. These engines are of the 4 cycle type and incorporate many improvements. They are fitted with bilge and air pumps, in addition to a large circulating plunger pump; the intakes are provided with slides, so as to cut out any cylinder, which is a convenient arrangement when a slower speed than the normal, is required. Force feed multiple oilers are used on all sizes; the bearings are of Babbitt metal and are of extra large size. The larger sizes are fitted with solid propeller and reversing clutch and on the smaller sizes the option is given of a clutch or reversing wheel. These engines are built by H. E. Hines Motor Company, of Traverse City, Mich., and are guaranteed for three years.



A 2-cylinder, 4-cycle Hines.

New Buffalo Auto-Marine.

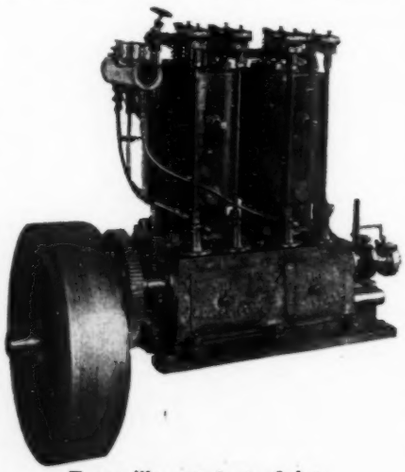
The engine shown in the accompanying illustration is the new 25 horse power Auto-Marine just put on the market by the Buffalo Gasoline Motor Company, of Buffalo. This machine is practically the same as the engines built by this company for automobile use, being changed merely in those details necessary to adapt it for marine work. The regular ring oiler system for crank pin lubrication with the mechanical oiler is used. The engine is completely equipped the same as the other well known Buffalo types including magneto and centrifugal pump. The bore is 4¼ inches and the stroke 5 inches and the horse power rating is taken on 800 R. P. M. The engine complete without the reverse gear weighs 500 pounds. An interesting fact in connection with these engines is that over twenty of them were sold before either the specifications or photograph were made public.

The 16-Horse Evansville.

This 2 cylinder engine is one of the products of the Evansville Gas Engine Works, of 1230 Riverside Ave., Evansville, Indiana. It is of the 4 cycle type of 6 inch bore and 6¼ inch stroke and at 500 R. P. M. is rated at 16 horse power. These engines, while especially designed for marine work, are in many respects similar to the high speed automobile engine, and are so well balanced that from 150 to 1000 revolutions may be obtained without excessive vibration. The rating is very conservative and is in fact but about half of what is obtained under favorable circumstances on the testing block. Although the storage battery is recommended to supply the current for the jump spark system of ignition, dry cells or magneto may be used, and will be supplied if desired. The Shebler carbureter is part of the regular equipment and the lubrication, water circulating system, etc., are all according to the most approved methods.

The Beilfuss Double Opposed.

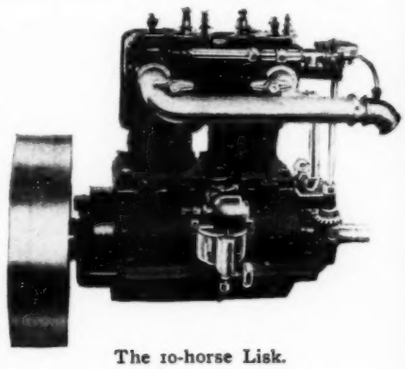
This is a 2 cylinder double opposed 4 cycle motor of 18-20 horse power manufactured by the Beilfuss Motor Company, of Lansing, Mich. It is perfectly adapted for boat use, as it is compact, light in weight, almost entirely free from vibration and is so low in the boat that it may be placed under a seat if so desired. This engine is extremely simple and the crank shaft, gears, cam shaft and piston can be removed without disturbing the cylinders. The bore and stroke are each five inches and the normal speed is 1000 R. P. M. although a range of from 200 to 1600 R. P. M. may be obtained. The weight, including intake and exhaust pipes, timer and fly wheel is 350 pounds and without the latter 254 pounds. The cylinders and heads are in one casting.



Evansville, rated at 16 h.p.

The Lisk 4-Cycle Motor.

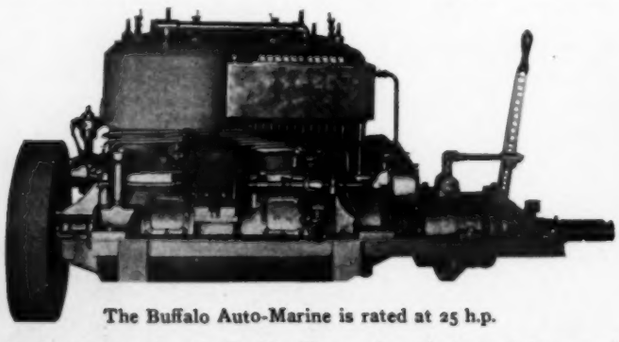
The illustration herewith is of the 10 horse power, 2 cylinder, 4-cycle Lisk motor manufactured by George A. Lisk, Detroit, Mich. Simplicity and ease of access to every part were kept in view in the design of this engine and these qualities have been well worked out. The cylinders are built with solid heads and the cylinder walls, exhaust and intake chambers are thoroughly water jacketed, keeping the engine perfectly cool while in operation. The valves are large, are both on one side and are mechanically operated. The pistons are provided with four rings and two oil grooves. The splash system of lubrication is employed, there being an oil tight partition between each cylinder, thus insuring plenty of oil at every point. Crank shaft bearing, cam shaft bearings, valve push rods and cylinders have extra sight feed oiler and the gears run in a separate enclosed bath of oil. The carbureter is of the float feed type and ignition is by jump spark.



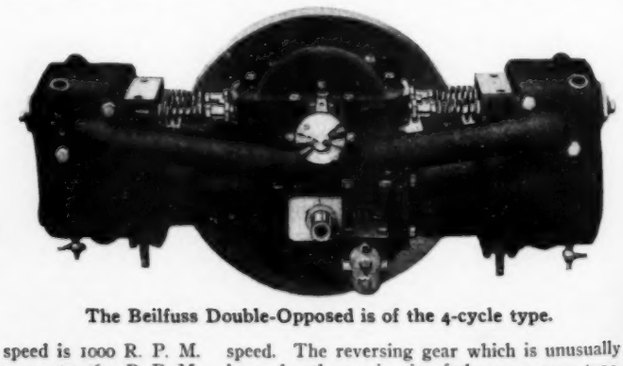
The 10-horse Lisk.

Gorham Open Base Engines.

A fine example of Western marine engineering is the 50 horse power engine manufactured by the Gorham Engineering Company, of Alameda, Cal. The open base construction employed in these engines has the double advantage of light weight and accessibility, which are essential features in high speed motor boat service. The ignition equipment consists of two individual systems each one complete in itself. The control is accomplished by means of a variable speed governor, regulated by a small handle conveniently located, which enables the speed of the engine to be kept constant at any R. P. M. This governor works in conjunction with the Schebler float carbureter which insures the mixture being adapted to the speed. The reversing gear which is unusually large for the engine is of the spur gear type, giving a ratio of 5 to 6 between the speeds of the propeller and engine. These engines show considerably more than their rated horse power at 700 R. P. M.



The Buffalo Auto-Marine is rated at 25 h.p.



The Beilfuss Double-Opposed is of the 4-cycle type.

New Things for Motor Boatmen.

New Attachments and Accessories That are Offered to the Man With a Boat. The Month's Production of Devices Designed as Aids to Motor Boating.

[Under this heading will appear each month descriptions and, whenever possible, illustrations of the various devices designed to add to the pleasure and comfort of motor boating which have been brought out since the previous issue. It should be kept in mind that the department in any one issue is, as it were, only one month's instalment of the many useful things on the market, and that it will be well to consult the previous issues of MOTOR BOATING which will form, together, a very complete illustrated directory of the things the motor boatman needs.—In writing the makers of the articles shown, if our readers will mention MOTOR BOATING, they will receive special attention.]

Fig. 1.—Manzel Valveless Automatic Lubricator.

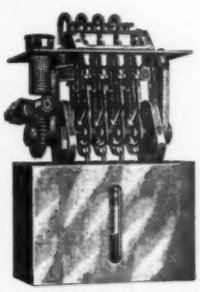


Fig. 2.—Valveless Lubricator showing action of pistons.

Fig. 3. — Connecticut Pocket Battery Tester.

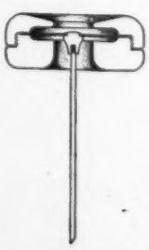


Fig. 4.—The Gaylor Sonoscope.

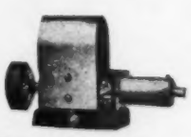


Fig. 5.—Perfection Automatic Battery Charger.

Valveless Automatic Lubricator (Figs. 1 and 2).—Chas. W. Manzel, 89 Main St., Buffalo. These valveless lubricators are so arranged that they will feed any amount of oil from a small portion of a drop to a stream at each stroke of the plunger. These plunger pumps, which are so powerful that they will force the oil against a pressure of two thousand pounds if necessary, are actuated twice for every revolution of the shaft and the regulation of the oil flow is effected by a thumb screw which engages the adjusting sleeve nut on the plunger. These lubricators can be made with separate sight feed on the bulkhead or they may be converted into a circulating system, operating pumps at full stroke to the part to be lubricated and with a return supply from the crank case, making a positive delivery for each feed. They are made in several sizes ranging from a capacity of two pints, listed at $11.80, to twelve pints listed at $64.30, and are finished in either brass, nickel or oxidized copper.

* * *

Pocket Battery Tester (Fig. 3).—The Connecticut Telephone & Electric Co., Meriden, Conn. These instruments are built with jewel bearings and are manufactured with the same care that is used in constructing a watch. The dial is of silver etched metal instead of the paper card usually used. A number of different styles of dead beat voltmeters and also combination volt and ammeters of the dead beat type are manufactured by this company. The voltmeter only is used for testing storage batteries, each cell of which should be tested separately. When the battery is fully charged, or when it is still charging, each cell should show 2½ volts and when the voltage falls as low as 1.7 they should be recharged. A storage battery cell on open circuit should show between 2 and 2.2 volts. The ammeter is, of course, used only for testing the condition of dry cells.

* * *

The Gaylor Sonoscope (Fig. 4).—Gaylor Automatic Stropper Co., Stamford, Conn. This instrument will be found most useful for locating loose parts which cause knocks or pounds in any gasoline motor. It consists of a sound receiver having a holder and an ear piece enclosing a sensitive diaphragm from which extends a slender steel testing rod, which for convenience is carried in several jointed sections. When in use the free end of the testing rod is placed successively on various parts of the motor, the sonoscope being held close to the ear. The great value of this instrument lies in the fact that much useless tearing apart of motors where no trouble exists is obviated.

* * *

Automatic Battery Charger (Fig. 5).—The Economy Manufacturing Company, Park Building, Pittsburg, Penn. This battery charger is designed to automatically keep the storage battery supplied with ignition current, obviating the annoyance of even removing the battery from the box. It consists of an electric generator of the magneto type, composed of but few parts which are impervious to rust and practically immune from the effects of dampness, dirt and oil. The magnets are of the horseshoe type specially treated and since the density of the magnetic field circuit always remains the same, wide variations in speed are permitted without ill effect to either the charger or the battery. An automatic cut-out is provided, which prevents the discharge of the battery through short-circuiting when idle or not up to its proper generating speed. An adjustable brass base is fitted to each charger, giving adjustment of the machine, either forward or backward by means of a single screw. The type C, shown herewith, weighs fourteen pounds and sells complete for $25.

O'Brien Electrophone (Fig. 6).—O'Brien Electrophone Company, Hallowell, Me. These new electrophones are extremely powerful and may be operated instantly by simply pressing a button placed either on the coaming or on the wheel. A foot plug attachment is also furnished which may be placed in any convenient position. The horn is of turned brass, highly polished and may be fastened to any part of the deck desired. It operates from four or five dry cells or from a storage battery and is very economical in its use of current. The price of the horn complete is $20.

* * *

Superior Double Spark Plug (Fig. 7).—Superior Motor Specialty Co., 526 Jefferson Street, Philadelphia. Two plugs in one socket, the insulating members of which are made in two pieces, separated by an asbestos copper-covered gasket, is the feature of one of the latest products of this company. Both sparking points are placed over or near the inlet valve of the motor, where they may be kept clean and cool and the fact that the insulation can be so easily removed makes the plug a valuable one. One electrode is used for the magneto and the other for the battery. If desired, one section of the plug may be removed and may be used as a priming cup and since there is no necessity for removing the socket from the cylinder, there is no wear on the threads to cause leaks. These plugs are made in all sizes and sell for $1.50 each.

* * *

Stickler Weedless Wheel (Fig. 8).—Stickler Weedless Wheel Company, Portage, Wis. As will be seen from the accompanying illustration, this wheel is designed to twist through weeds rather than to cut them and its shape is such that tough clinging water plants cannot lodge in the blades or clog them. It is said that practically the same speed can be maintained through weeds with no extra demand on the power. The wheel takes the water first at its centre where the blades are running directly toward the water and the volume of water is gradually displaced in increasing amount to the outer edges of the blades.

* * *

Automatic Air Pump (Fig. 9).—Rohrbacher Automatic Air Pump Company, Portland, Ore. This is a specially designed split eccentric marine air pump for furnishing air for whistle tanks or other purposes on boats of all sizes. The eccentric is split and can be attached to the shaft in a very few minutes. By means of the flexible tube connection and construction of the base plate, this pump can be placed in any position at any angle and takes up very little space. All parts are interchangeable, the piston and rings being ground to a perfect fit. The pump has a stroke of 2½ inches, a bore of 1½ inches and is fitted with an automatic intake valve and a ball delivery valve. The price is $15.

* * *

Elba Lighting System (Fig. 10).—The Willard Storage Battery Company, Cleveland, Ohio. This lighting system is exceedingly simple, inasmuch as it can be attached to any motor on which there is an existing electric lighting equipment and storage battery by merely leading two wires from the generator direct to the battery. The system is very economical as when the engine is running the generator will supply current until the battery is fully charged at which time the generator is automatically cut down until the battery falls below its maximum, when the generator will again supply sufficient current to bring up the battery charge again. When the battery is fully charged and the engine is running the generator will supply current direct to the lamps and when the motor is at rest the lamps are operated from the battery.

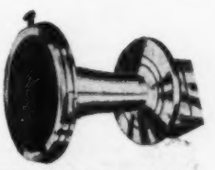


Fig. 6.—O'Brien Electrophone.

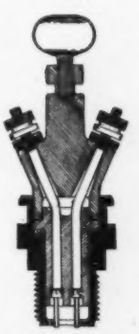


Fig. 7.—Superior Double Spark Plug.

Fig. 8.—Stickler Weedless Wheel.

Fig. 9. — Rohrbacher Automatic Air Pump.

Fig. 10. — Tungsten Lamp used in Elba Lighting System.

Fig. 11.—Atwater-Kent Unisparker.

Type B. Unisparker (Figs. 11 and 12).—Atwater Kent Mfg. Works, Philadelphia. This battery ignition device is intended to take the place of the common timer and vibrator coil of the jump spark ignition system, or the sparker and coil of the make-and-break system. It is economical in operation, since it fires four or six cylinders in exact synchronism under all conditions and is entirely free from delicate wearing parts and adjustments. Contact is made and broken mechanically, not by magnetic action, and it is said that the sparks are just as regular from a battery testing two amperes as from one testing thirty. They are made in one, two, three, four or six cylinder designs, ranging in price from $18 to $32.

* * *

Fig. 12.—Coil Box for Type B Unisparker.

Gordon Propeller (Fig. 13).—Gordon Propeller Company, Ltd., 9001 Desmond Avenue, Cleveland, Ohio. As will be noted from the accompanying illustration, this new reversible propeller acts upon the principle of rotating the sleeve upon the main shaft instead of sliding it through the stuffing box as is the usual method. With the use of this propeller the operator has his boat under control at all times by the simple moving of a lever, and it is claimed that every part of the mechanism is several times as strong as the shaft or blades themselves, so there is little possibility of damage to the reversing gear. The illustration shows the internal construction of the hub with one blade removed and the other turned to a neutral position.

* * *

Fig. 13.—Gordon Reversible Propeller.

Pocket Filter (Fig. 14).—Abercrombie & Fitch Company, 57 Reade Street, New York. These filters are very small and compact and can be used either for the purpose of drinking direct from a river, pond or vessel filled with water or as a syphon. After an immersion of about one minute, the water may be sucked up through the mouthpiece, all impurities contained in the water being held back on the surface of the filtering stone. When used as a syphon, the filter may be started at night and in the morning, a plentiful supply of pure water will be ready. All parts are easily accessible and may be cleaned without any trouble. The size is 3¾x2 by 3⅛ inches and the filter, complete, weighs but 11 ounces; the price is $2.50.

* * *

Fig. 14.—A. & F. Pocket Filter.

Habirshaw Automobile Cables (Fig. 15).—Habirshaw Wire Company, 253 Broadway, New York. These cables are made in a great many different styles but one grade of rubber compound is used throughout, which is well protected from oil. A rubber filled vulcanized tape so treated as to resist oil, gives both a water-proof and a mechanical protection to the conducting material. They are braided with fine linen thread passed through an oil resisting compound, the braid being of a light brown color with three blue threads through it. There are three forms of secondary cables manufactured, having a five, a four and a three thirty-second inch wall of rubber, respectively. These sell for $190, $145, and $80 per thousand feet. A primary cable, having a 5/64 rubber wall, sells at $40 per thousand feet, and plain ignition cable, having no tape or braid, sells at $88 per thousand feet. Multiple conductors are also furnished, varying in price from $77 to $195 per thousand feet.

* * *

Fig. 15. — Habirshaw Automobile Cable.

Dow Perfected Magneto (Fig. 16).—The Dow Manufacturing Company, Braintree, Mass. While these magnetos embody a number of new features, the most interesting is the improved interrupter adjustment, which may be seen in the accompanying cut. Since the dependability of a magneto rests upon the interrupter, which is the make and break of the current, a broad contact point with facilities for easy adjustment, when necessary, is essential. The interrupter adjustment of this magneto, is entirely mechanical and automatic, a notched ring on the front face of the magneto being turned counter clockwise until the engine ceases to fire. A turn of five notches clockwise, adjusts the points at the proper distance of 1/100 inches apart, the adjustment being made without the use of any tool. The retail price of these magnetos is, one cylinder, $70; two cylinder, $80; four cylinder, $110, and six cylinder, $120, each subject to a 5% discount for cash.

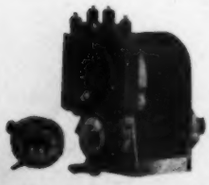


Fig. 16.—Dow Perfected Magneto.

Marine Tachometer (Figs. 17 and 18).—The Industrial Instrument Company, Foxboro, Mass. The object of this instrument is to provide a means of signalling to any part of the vessel desired, the exact speed of the shaft at all times. It is especially useful upon cruisers of the larger type inasmuch as the steersman can tell in which direction his engines are running and at just what speed, a knowledge which would have prevented many of the accidents which have occurred. The tachometer is electric in its operation and is connected to the shaft by a Morse Silent Chain, as may be seen from the illustration. The indicators are made in various types for different parts of the vessel, and are calibrated in knots if desired to show actual speed travelled. A feature of the instrument is an ingenious method for damping out the fluctuations due to angular changes in the velocity of the screws.

* * *

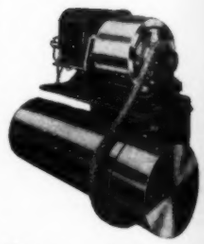


Fig. 17. — Hutchinson Marine Tachometer.

Fig. 18.—Pilot House Indicator for Marine Tachometer.

Arco Spotzoff.—The Atlantic Refining Company, Cleveland, Ohio. This is a creamy liquid metal polish, manufactured especially for use upon automobiles or motor boats, where there is considerable brass and nickel work. It contains no acids or strong alkali and while it cannot injure metal or hurt the hands in any way, it gives a brilliant and lasting polish to brass, nickel, steel, aluminum and other metals. This metal polish can be used to the last drop in the can, inasmuch as it does not cake and requires but very little rubbing, to produce a lasting lustre. This product is manufactured by the same concern who make the Arco lubricants and generous samples are being sent to those who desire.

* * *

McNutt Non-Explosive Devices (Fig. 19).—The McNutt Non-Explosive Mfg. Co., 122 Morningside Ave., E., Manhattan. The device shown in the accompanying cut is designed to fill the opening of the gasoline tank and consists of a fire-screen tube which serves the double purpose of a gasolene strainer and also prevents a flame from entering the gasoline tank. The safety screw cap is provided with a check valve for gravity system which prevents gasoline vapor from leaving the tank, but still allows air to pass in A fusible disc valve in the screw cap gives sufficient vent to internal pressure if fire comes in contact with the tank to cause the gasoline to burn without any danger of explosion of the tank. This screw cap is also provided with a fire-screen which prevents back-drafting after the vent has fused. It is said that with the use of this device, it is absolutely impossible for a gasoline tank to explode. The price is $6.

* * *

Fig. 19.—McNutt Non-Explosive Device.

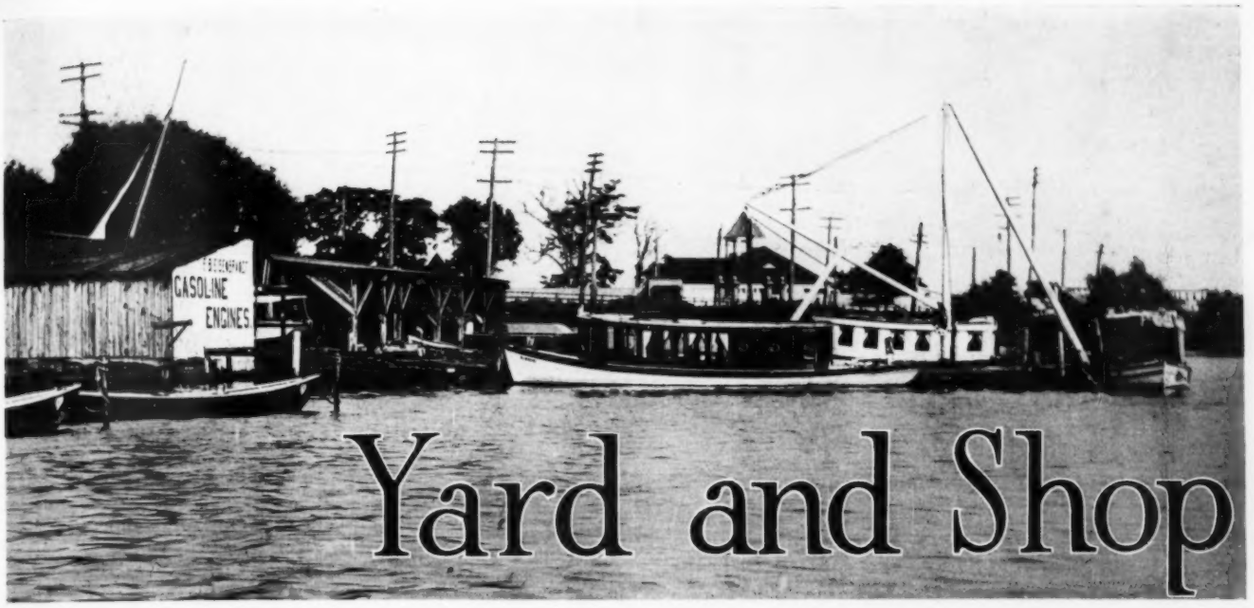
Caco Air Whistle (Fig. 20).—Gleason-Peters Air Pump Co., 255-261 Clason Avenue, Brooklyn. Although this whistle has been on the market for several years it has recently been so improved that it is worthy of notice from the motor boatman who wishes his craft equipped with an efficient signal. An air regulating device has been added to the valve which does away with the old method of loosening screws and moving the bell of the whistle up and down. By means of this regulator it is possible to adjust the whistle to blow under any pressure from 5 pounds up to 300 pounds. The instrument is a four tone chime whistle, the tones of which are so carefully blended that they are said to produce within one-eighth of a note of absolute harmonics. The whistle uses a very small amount of air in proportion to the volume of tone and the sound has a quality which makes it carry to a great distance. The 1½ inch whistle sells for $5 and the 2 inch for $7.

* * *

Fig. 20.—Caco Air Whistle.

Lehman Porcelain Distributers (Fig. 21).—J. H. Lehman Mfg. Co., Inc., 500 Fifth Avenue, New York City. The feature of these waterproof distributers, a sectional view of which we show herewith, is that but one mechanism is used, namely, the circuit breaker to produce the spark, which gives synchronous timing at all speeds. Since the usual time lag found in many vibrator coil systems is practically absent in this device, the frequent advancing or retarding the spark is avoided, making conditions similar to magneto ignition. The illustration shows the highly glazed porcelain housing and porcelain disc which carries the high tension distributer arm. The adjustments of these distributers are very simple and the device will give a hot fat spark whenever required. The price ranges from $16 for three cylinders to $20 for eight cylinders.

Fig. 21.—Lehman Water-proof Porcelain Distributor.



Yard and Shop

WE show above a photograph of the plant of Fred B. Eisenbrandt, which is located at Spring Gardens and is one of the most popular motor boat repair shops in Baltimore. The growth of motor boating in this neighborhood is shown by the fact that this year will be the largest since this shop has been in operation, there being on hand at present nearly fifty boats of various sizes to be fitted out.

The Michigan Wheel Company, of Grand Rapids, Mich., have lately been so crowded with orders that they have been obliged to double their force of men and keep their plant in operation day and night. The orders which they have on hand for speed propeller wheels and reverse gears would indicate that the coming season is to be one of the largest in the history of motor boating.

The Dewey, owned by Walter F. Coachman, of Jacksonville, Fla, which won the 103¼ nautical mile race at Palm Beach recently, for which the prize was $2,500 in gold, was equipped with a 46-65 horse power Sterling engine.

The Caille Perfection Motor Company, of Detroit, have recently been building up a large export business and are today sending engines to many parts of the world. Their agent at Melbourne, Australia, reports that their 4 horse power engine is doing service in a 27-foot boat, driving it loaded with 11 people and several boxes of pig iron and granite, at 6 miles an hour.

The Toppan Boat Manufacturing Company, of Medford, Mass., have been obliged, owing to an unusual number of spring orders, to begin working overtime in order to have no delay with their shipments They have recently shipped a number of boats and engines to various towns in Florida, New Hampshire, New York, Alabama, Massachusetts and Nova Scotia.

The R. L. Kenyon Company, Inc., of Waukesha, Wis, recently shipped to the W. H. Mullins Company, of Salem, Ohio, a 50-foot furniture carload of Kenyon tops and cushions. This is said to be the largest single shipment of this class of goods ever made, the value of the goods in the one car being about $1200.

The Solid Blade Reversible Propeller Company, of Bennington, Vt., is a new concern capitalized at $5,000, for the purpose of manufacturing and selling motor boats, engines and solid blade reversible propellers.

The Atlantic Company, of Amesbury, Mass., with the object in view of developing the designing of a moderate sized speed hull especially adapted to the Revillion Light Six-Thirty, an engine made by this company, are offering a silver trophy cup for 1910 to the designer of the boat which makes the fastest mile when equipped with the Revillion engine.

The Richardson Engineering Company, of Hartford, Conn., equipped the cruiser Onward, which took a 9,000 mile cruise down the Mississippi, along the Gulf and up the Atlantic coast, with one of their lighting outfits and are pointing to the excellent service rendered with a great deal of pride. Idaho, the first Bermuda boat to be electrically equipped, was also provided with one of their outfits.

The Ferro Machine and Foundry Company, of Cleveland, Ohio, have received an order from the United States government for six 4 horse power Ferro engines with reverse gear equipment for use in the navy yards at Portsmouth, N. H. A 12 horse power engine with complete equipment has also been furnished to the Volunteer Life Saving Service of New York City.

The Gray Hawley Manufacturing Company, of Detroit, Mich., owing to increasing business which made it impossible for them to fill the demand for the Little Skipper engine, have sold the Skipper engine business to the Monarch Tool and Manufacturing Company, of 120 Opera Place, Cincinnati, a company which is equipped to manufacture the engines on a large scale.

The General Machinery Co., of Bay City, Mich., makers of the Smalley engine, have recently added an improvement to their motors in the form of aluminum cylinders and it is their intention to enable all motor manufacturers to supply aluminum engines at slight expense when desired by their customers. Motor makers and users alike have been invited by the General Machinery Co. to visit their Bay City works where the whole process will be shown and explained.

J. F. Reeder, a boat designer of Philadelphia has proposed to give amateur boat builders a chance to show their skill and for this reason six cups are to be awarded to winners in their respective classes, all boats to be built from paper patterns, blue prints and instructions furnished by the amateur designer and classified according to the horsepower of the motor used.

Courier II, owned by W. J. Conners, of the Buffalo Motor Boat Club, which won the first race of the meet at the Sixth Annual Regatta of the Palm Beach Power Boat Association on March 15th and which made an average speed of 30.368 statute miles an hour, is equipped with a 240 h.p., 8 cylinder Sterling racing engine.

The Fry Manufacturing Company, of 1779 Broadway, New York City, will hereafter have the exclusive sale of the Fry Spark Plug which has heretofore been handled by the Standard Sales Company. The latter company is in liquidation.

The Marine Engine and Supply Company, of Los Angeles, Cal, report a great increase in power boating upon the Pacific coast during the present season. They have recently sold a number of Perfection, Ferro and Frisco Standard engines which have been placed in boats which will be used in that section this season.

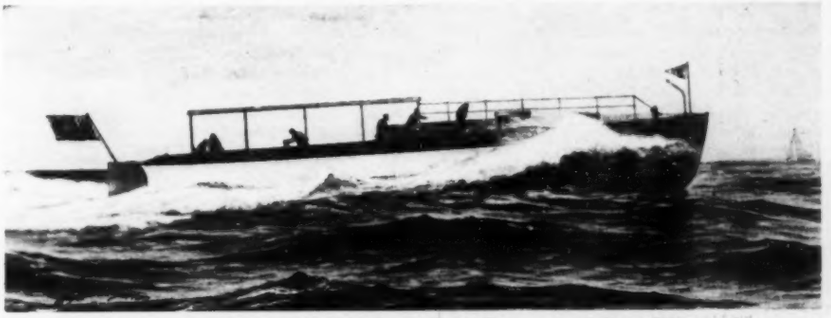
The West Side Y. M. C. A. of New York City established four years ago a motor boat school which has been added to every year until now there are three classes meeting every week and it is expected that another one will be added in a short time. The school has a fully equipped gas engine laboratory, containing six working engines and the course consists of a thorough study of the marine motor.

The Syracuse Gas Engine Company, of Syracuse, N. Y., since their reorganization have added considerably to their capital and have leased a modern manufacturing plant. In addition to their marine engine, they are shortly to place upon the market a variety of water cooled and stationary engines for agricultural uses.

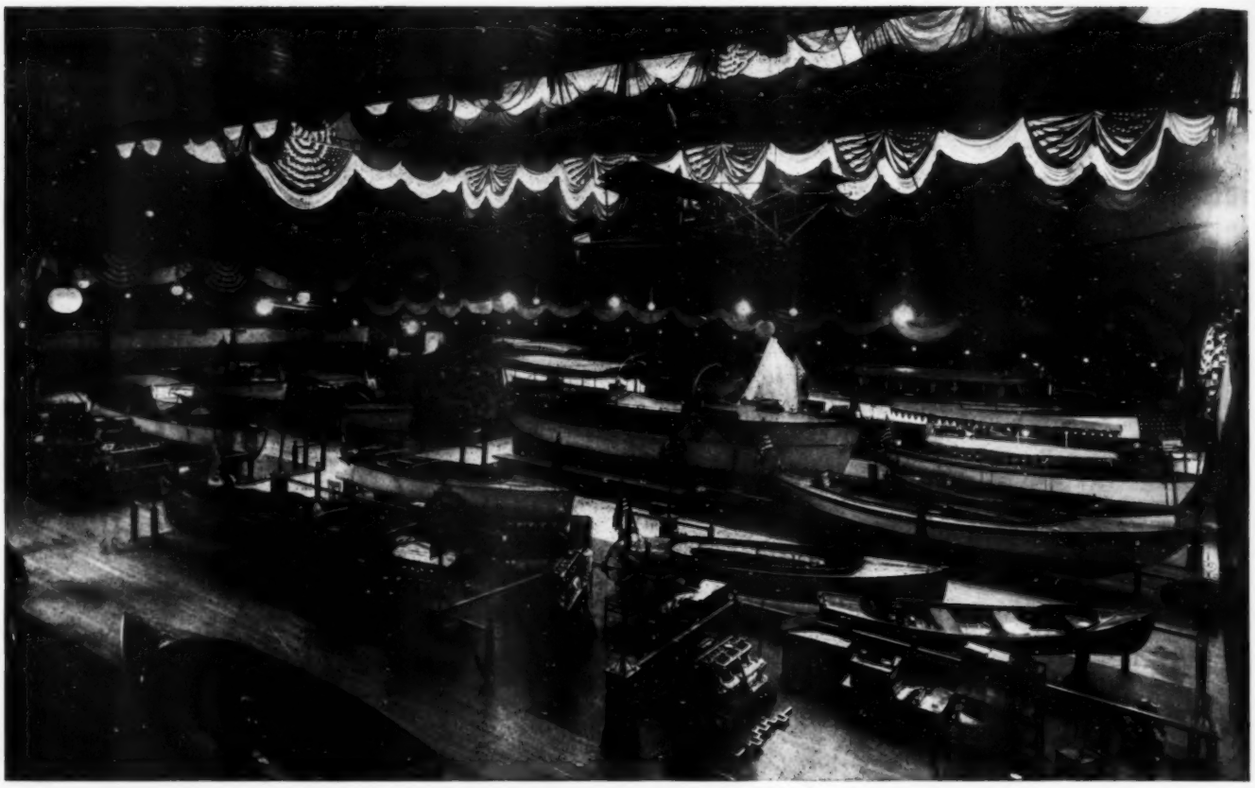
The Atlantic Maritime Company, 95 Milk Street, Boston, are New England distributors for the product of the Osburn Electric Company, of Detroit.

The Sterling Engine Company, of Buffalo, N. Y., owing to increasing business, have removed their New York agency from 136 Liberty Street, to 141 Liberty Street. It is in charge of H. L. Edge.

The Jeffery-Dewitt Company, of Newark, N. J., on May 1st took possession of their new plant at Detroit, Mich., and will hereafter manufacture all of their spark plugs in that city. A pottery department has been added to their equipment, where they will manufacture their



Speejacks—a product of the Matthews Boat Company of Port Clinton, O.



General view of the motor boat show which was held recently at the First Regiment Armory, Chicago.

Navigating the Upper Hudson.

(*Continued from page 14*).

no trouble. When nearing the night boat dock at Troy run up close to the east shore and HOLD IT until past the second bridge when you will see a low island which you must run over by and along its shore to almost the end, when you may head for the Sloop Lock, being careful not to hit a rock that is just to the west of the entrance of it, and also that the water rushing out from the sluiceway under the factories does not get a hold of your boat and carry her out of the channel, if necessary drop your anchor until you get into the lock.

At this lock it is necessary that you show a pass from the Superintendent of Public Works at Albany, which costs you nothing but is essential, and which you might get by writing for or by calling when you are in the city. After reaching the upper level, which is still the Hudson but some ten or twelve feet higher due to the big state dam, you must hug the east shore for about 4 miles or until you are just this side of what remains of an old bridge, one of the uprights of which is still standing, when by looking across, you will see the entrance to the Side Cut locks and the new Barge Canal, which you must cut straight over to, as there are rocks to the north and south. These locks will lift you right up to the Champlain Canal and just a little below the town of Waterford.

Regarding the tide, you will find strong tide all the way up to the State Dam at Troy where the rise and fall is about two feet. Over the shallow places it runs very swiftly and in steering you want to take this into consideration.

I sincerely hope that this article, while not interesting reading, may be the means of saving some fellow lover of the greatest of all sports a portion at least of the trouble and guess work that I had on my first trip over this good old Hudson River.

Distances from the Battery, N. Y., to Waterford, N. Y.:

Yonkers	17	Rhinebeck	90
Dobbs Ferry	23	Saugerties	101
Tarrytown or Nyack	28	Catskill	112
Ossining	34	Hudson	116
Peekskill	44	Coxsackie	123
West Point	51	Stuyvesant	127
Cornwall	56	New Baltimore	131
Newburgh	61	Coeymans	135
Poughkeepsie	76	Albany	144
Hyde Park	81	Troy	151
Esopus Island	84	Locks at Waterford	about 156

The Dory a Good Tender.

(*Continued from page 37.*)

FOR a cruising tender I am strongly in favor of the small dory. While I realize that it does not look quite as nice as some of the round bottom cedar tenders, I believe the looks are more than offset by its many advantages when on a cruise.

While under way I should carry it on top of the house. Being flat bottomed it would need no cradle, and I should keep it in place with four small blocks of wood, two forward and two aft, fitting quite snugly, to prevent it working to and fro, and four ring bolts to lash to.

The dory is easily handled, two fellows readily taking it aboard or putting it over without being obliged to have davits. If you wish, two may be carried and by nesting them when on board the two will occupy no more space than one, and sometimes when cruising with a party of four or more two tenders come in very handy.

The dory is an excellent sea boat and can carry a big load when necessary. Then in landing one is not always at a club float and a dory slides up on the beach easily. If the tide goes out and leaves it high and dry it is no trouble to drag the little boat over the flats to the water.

Of course if a person were always going to land at the float of some club he would like a more stylish tender, but for all round cruising purposes the dory is hard to beat when you consider the ease of handling, carrying capacity and seaworthiness.

F. M. COMEE, Cambridge, Mass.

Talks with our Naval Architects.

(*Continued from page 38.*)

probably shall do in the near future in the rotary manner which is now so successful in steam practice.

"I don't think I speak with bias when I say that the hull designers are a bit in advance of the engineers. The public is sometimes mistaken over that. As a matter of fact we designers and builders call for more power, for much more even than we get today and we can still stand it. As to the old speed laws which have been axiomatic so long, they are already being surprisingly upset in the case of the power boat. Small light craft carrying very high horsepowers do not follow the speed rule of the square, cube and fourth power at all. Even putting the hydroplane principle apart, speed now increases in such boats at a greatly lower ratio as regards power produced.

"Great Britain is going ahead rapidly but the French have established a long lead, and some of the American types are of a very advanced standard and of most ingenious lines. Here we began late. As late as 1904 there was not a single motor boat club in the United Kingdom."

Regarding the Humphrey Bill.

(*Continued from page 33.*)

the Humphrey Bill might come to a vote at any time. Will you kindly follow this up for your readers and let us know whether such has been the case. EDWIN PRELLWITZ.

New York City.

[Nothing has been done in regard to the Humphrey Bill since the article mentioned appeared in the February issue and the bill probably never will be brought before the House. There are at present two bills, one before the House of Representatives and one before the Senate, covering much the same field as the Humphrey Bill. These bills, which are practically identical, and a table showing wherein, if enacted, they will change existing laws will be found in this issue.—ED.]

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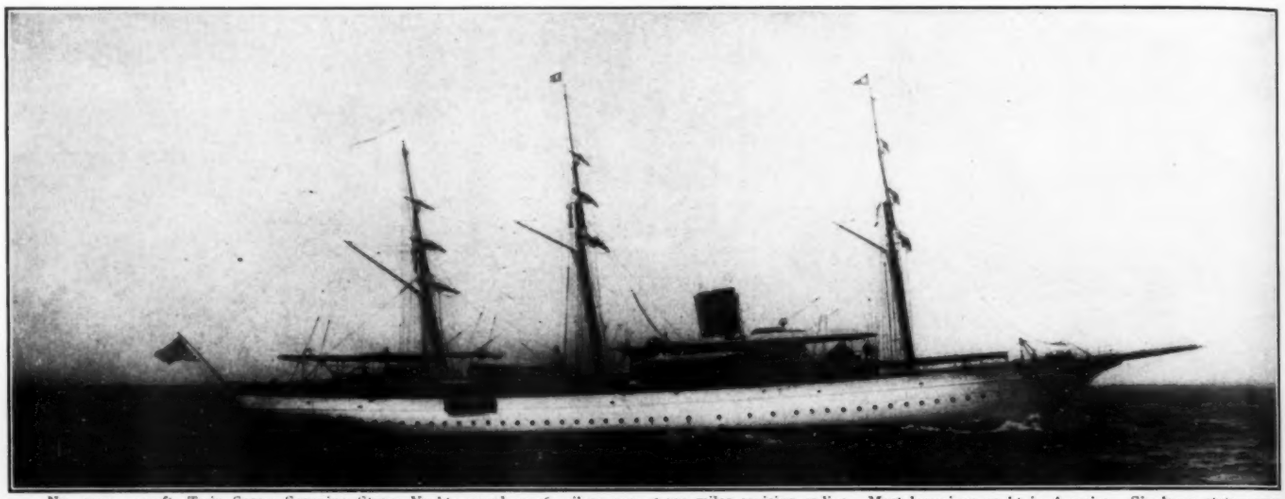
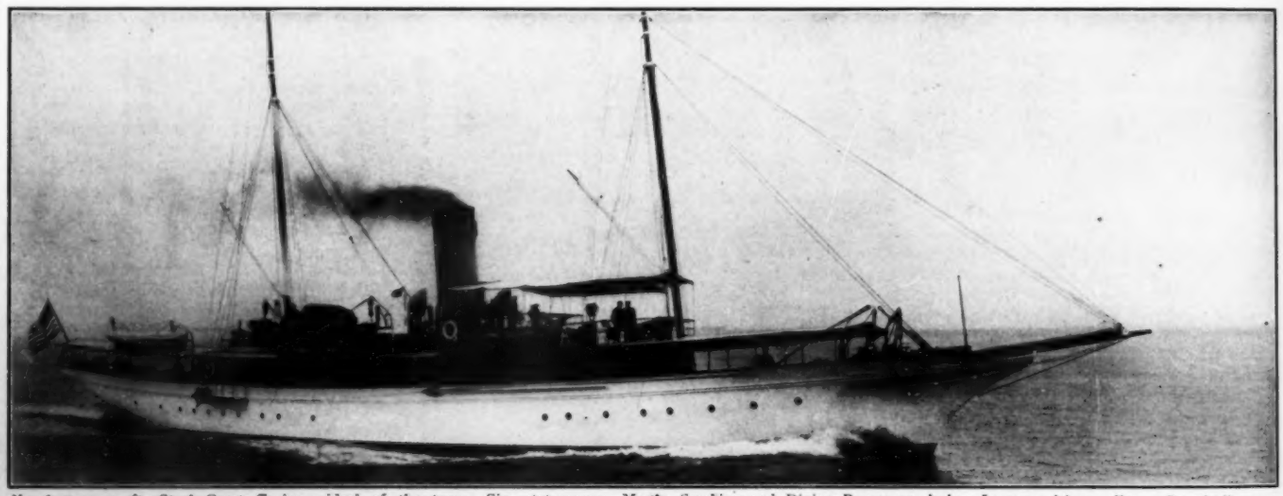
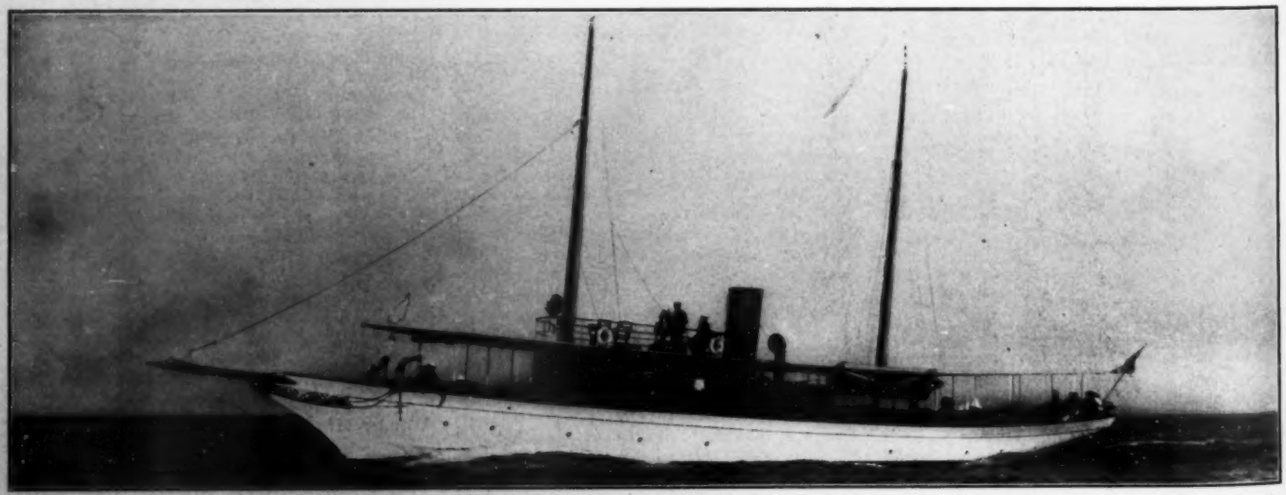


No. 5334.—243-ft. Twin Screw Seagoing Steam Yacht; speed 13-16 miles; over 3,000 miles cruising radius. Most luxurious yacht in America. Six large staterooms; 3 baths; 3 saloons in hand-carved mahogany and tapestry. Steam laundry. Electric lights; steam heat. Ice machine. In perfect condition. Engines and boilers only used on trial trip. Suitable auxiliary Naval Vessel. Price, one-fifth of cost. Apply to Stanley M. Seaman.



No. 6073.—170 ft. Steel Coast Cruiser; ideal of the type. Six staterooms; Music, Smoking and Dining Rooms on deck. Large cruising radius. Practically new. Available one-half cost. Condition warranted by Stanley M. Seaman.



No. 5144.—Wooden Steam Yacht, 117 ft.; built 1907; 4 staterooms; 2 baths; large deck dining saloon; Sullivan triple engine; speed, 12 knots; completely equipped; maintained more economically than gasolene same size and speed. Price very low; owner building one larger. Condition warranted by Stanley M. Seaman.

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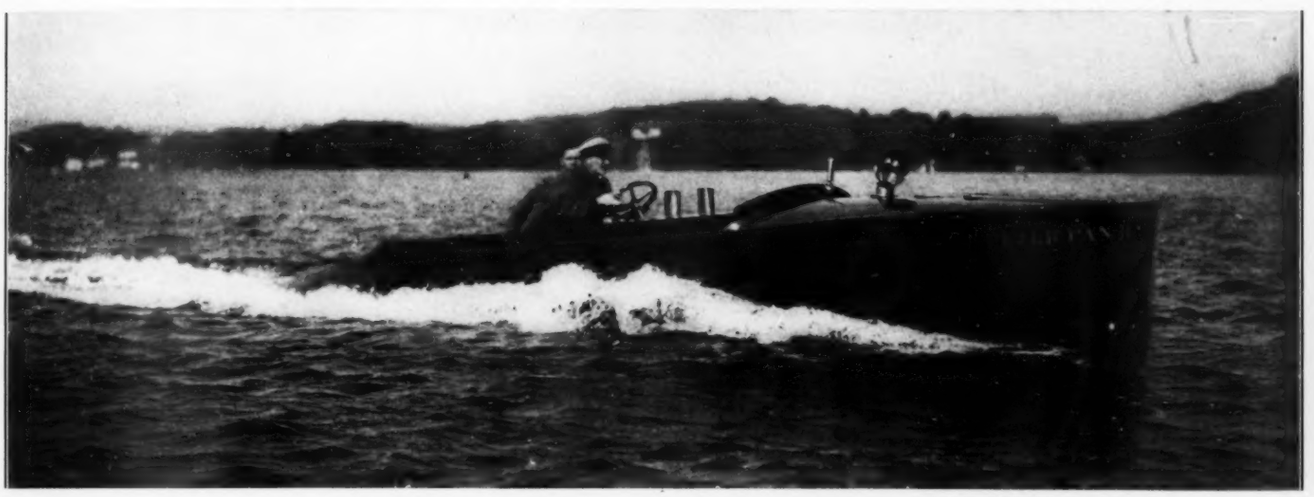
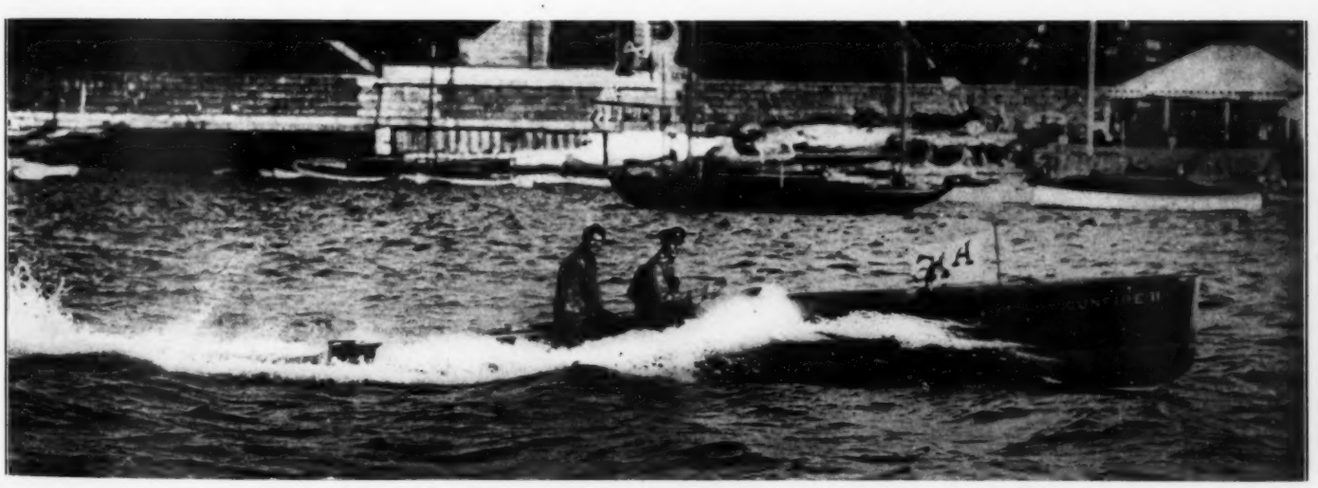
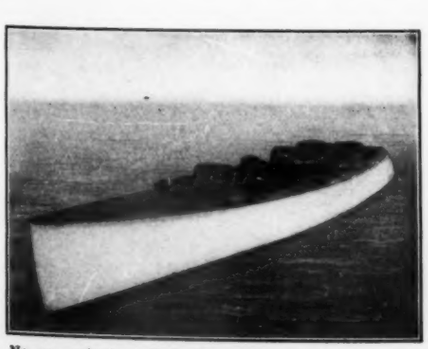


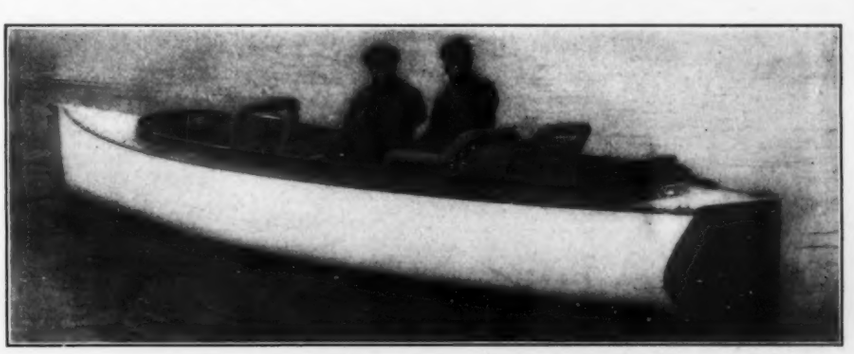
No. 31. Famous Peter II. All mahogany. 28'x4'2". Capacity eight passengers. Speed 24 miles.
Please mention MOTOR BOATING.



No. 29. Gunfire II. Fastest 25-footer in world. Perfect condition. Speed 26 miles.
Please mention MOTOR BOATING.



No. 24. 23'x5'; 14 H. P. Mercury motor; speed 15 miles. White cedar planking; mahogany decks.
Please mention MOTOR BOATING.



No. 27. 21'x4'8; 6 H. P. Mercury. Speed 11 miles.
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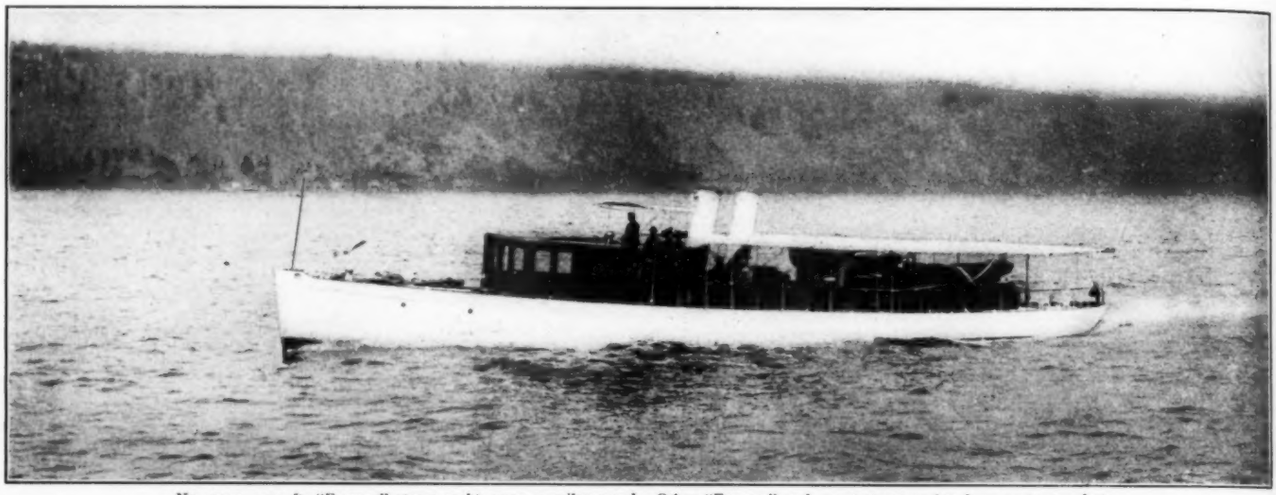
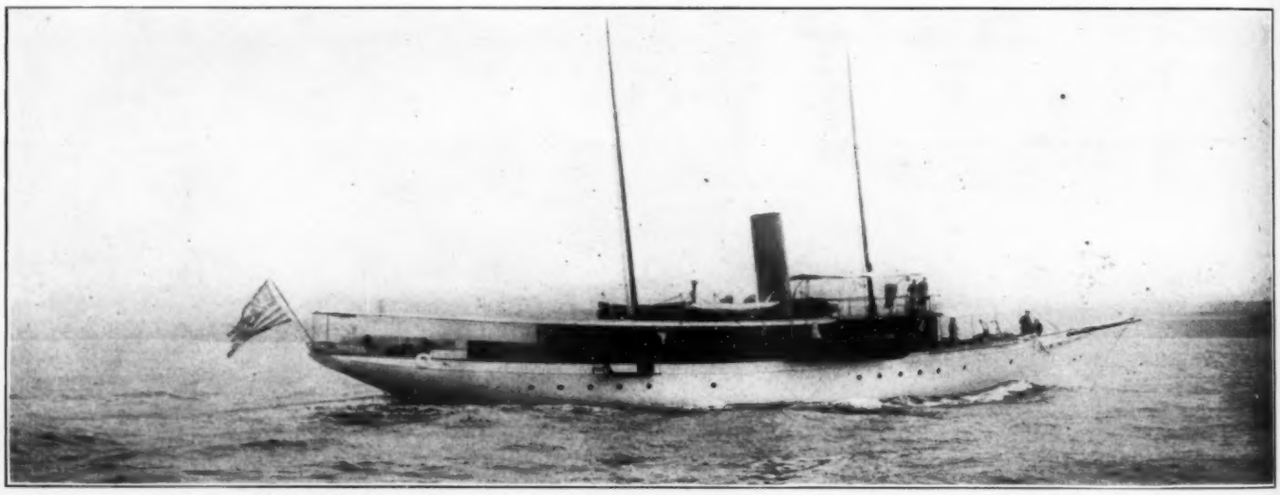
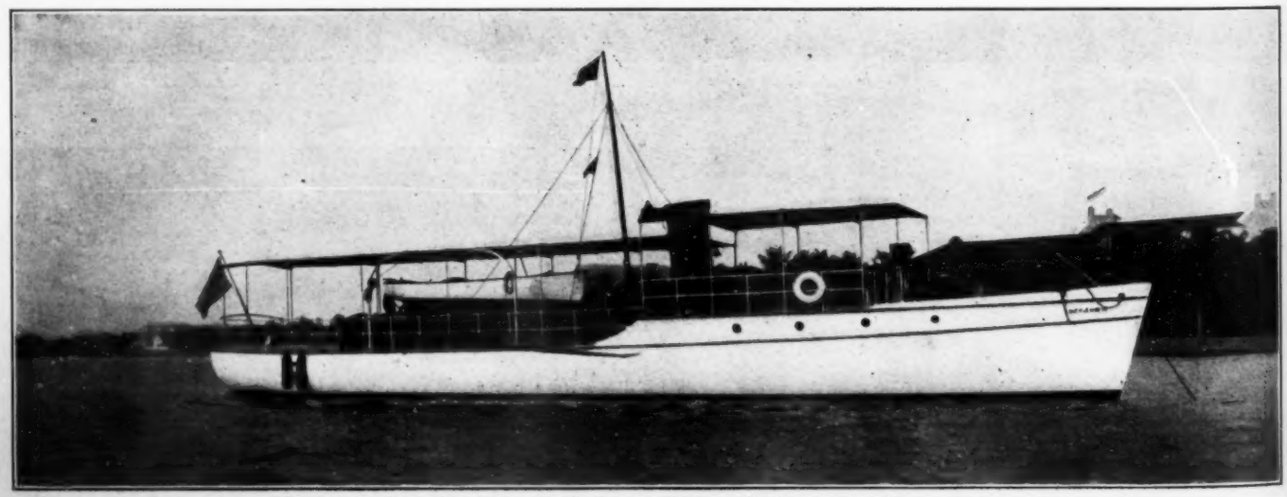


No. 2414. 100 ft. "Express" steam yacht, over 20 miles speed. Other "Express" and coast steam yachts from 75 to 175 feet.
Please mention MOTOR BOATING.



No. 87. 130 ft modern steam yacht; could be chartered. Other sea-going steam yachts ranging from 125 to 300 ft. length.
Please mention MOTOR BOATING.



No. 4230. 70 ft. gasoline cruiser; Standard motor. Other gasoline boats ranging from 25 to 125 feet.
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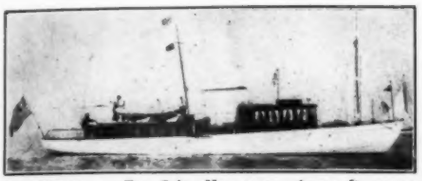
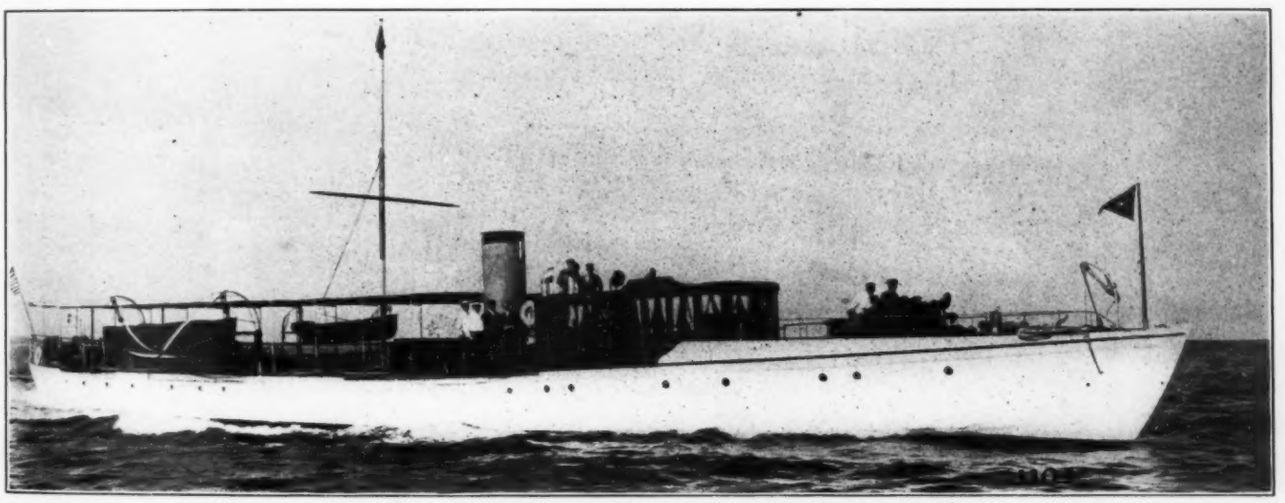


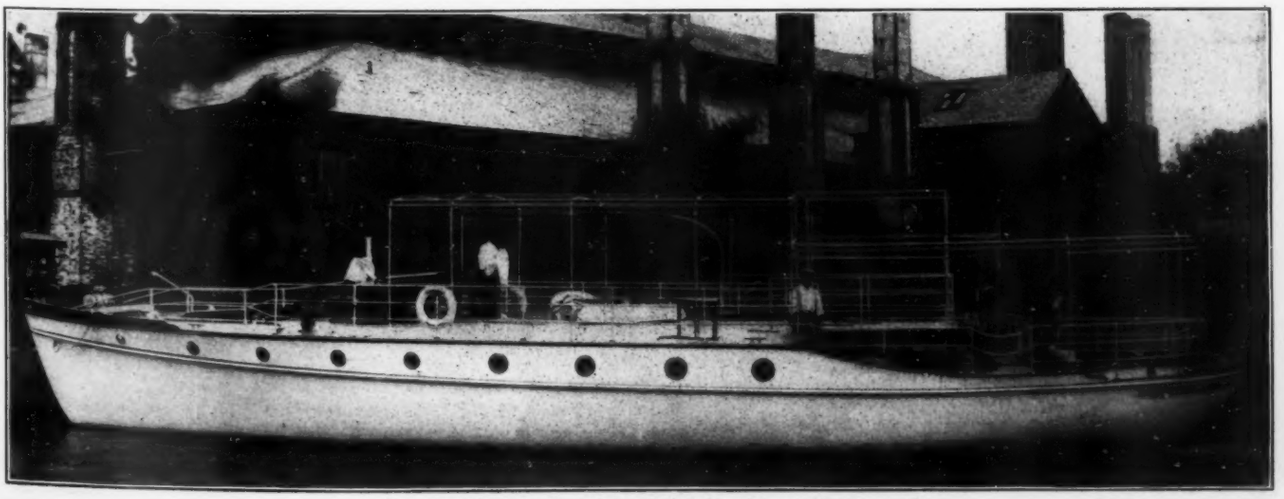
For Charter or For Sale, No. 1075. 69x12 ft. power yacht; 50 H. P. Standard.
Please mention MOTOR BOATING.

No. 2682. 43x8 ft. fast cruiser; speed 13 to 14 miles; very complete.
Please mention MOTOR BOATING.

No. 2445. Bargain; hunting cabin launch, 36.6x7.6x2.6 ft.; built 1908; mahogany finish; cockpit 12 ft. 6 in. long; 15 H. P. 20th Century motor; excellent equipment.
Please mention MOTOR BOATING.



No. 1104. 138 ft. twin screw steam yacht; speed up to 17 knots. Unusual opportunity.
Please mention MOTOR BOATING.



No. 2785. For Sale—61x13.6 ft. raised deck cruiser; speed 12 to 14 miles.
Please mention MOTOR BOATING.

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549. For Sale or Charter—Gasoline cruising launch; 69 x 60 x 12 x 4 ft. 6 in. draft; Lawley design and build; sleeps seven comfortably; privacy in owner's quarters; 50 h.p. Standard engine; speed 14 miles; electric lights; all conveniences. Prices attractive.

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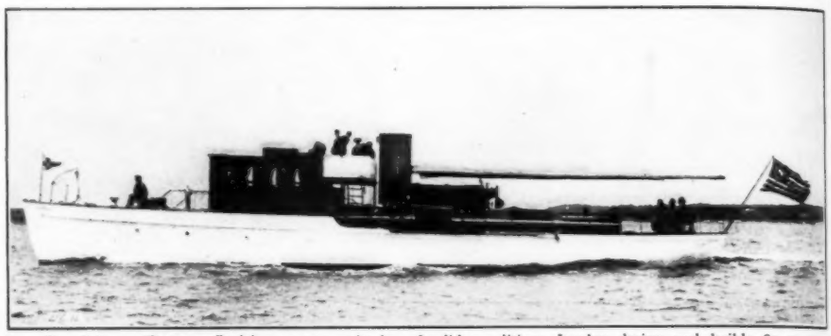
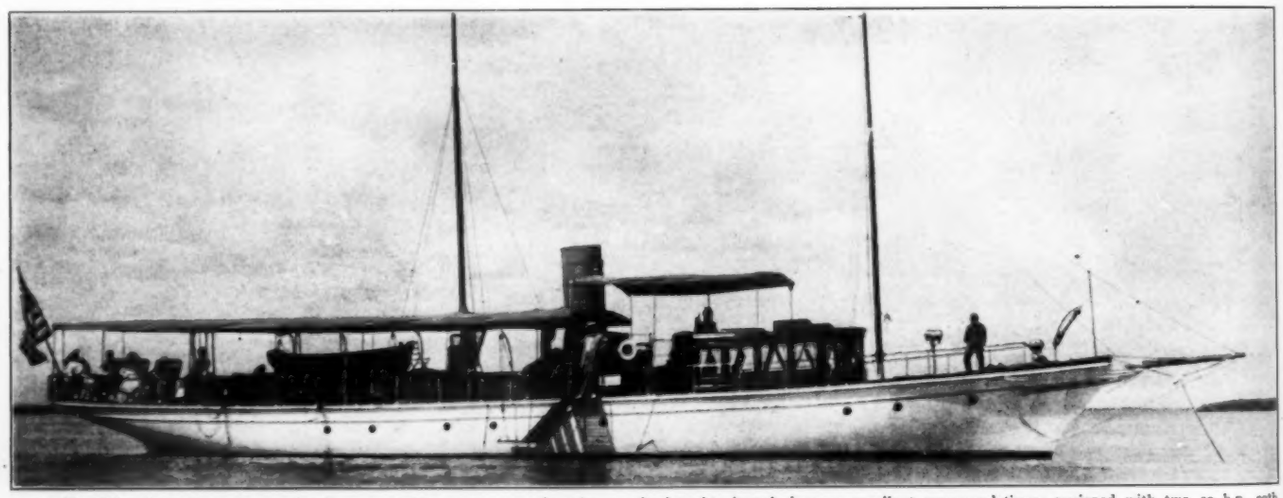


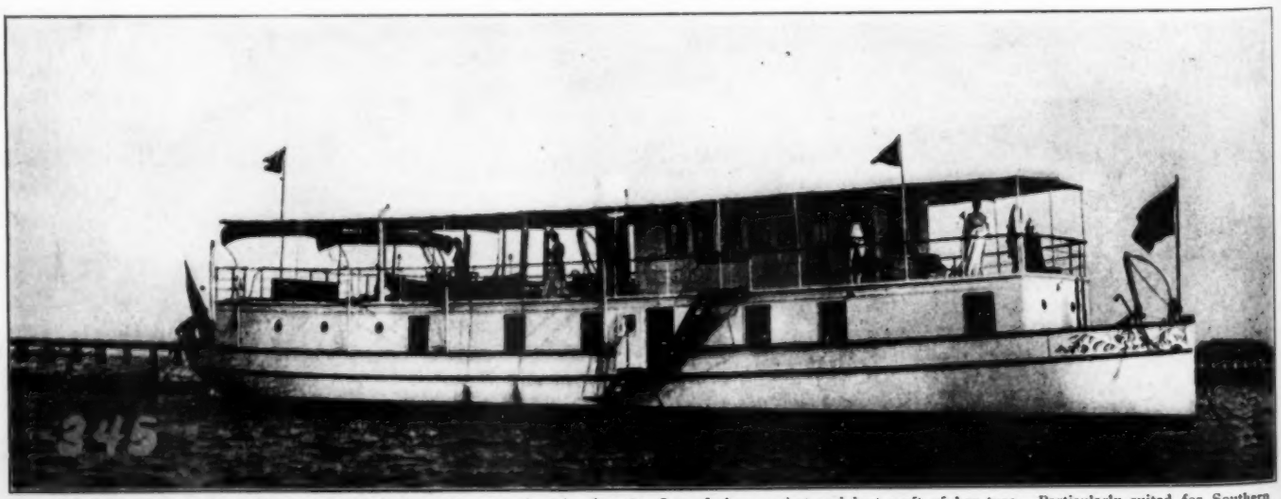
464. For Sale or Charter—Cruising motor yacht in splendid condition; Lawley design and build; 81 x 73 x 13 x 4 ft. draught; launched in 1907; speed 15 miles; two double staterooms, bath, two berths in saloon; sleeps nine; equipped with 100 h.p. Standard, self-starting. Prices attractive.

Please mention MOTOR BOATING.



573. For Sale—Attractive schooner-rigged power yacht; 90 x 75 x 14 ft. 6 in. x 3 ft. draught; launched 1909; excellent accommodations; equipped with two 30 h.p. 20th Century motors; all conveniences; suitable for Southern waters. Price attractive.

Please mention MOTOR BOATING.



345. For Sale—Twin-screw gasoline power houseboat; 69 x 21 x 2 ft. 6 in. draught. One of the roomiest and best craft of her type. Particularly suited for Southern waters. Price attractive.

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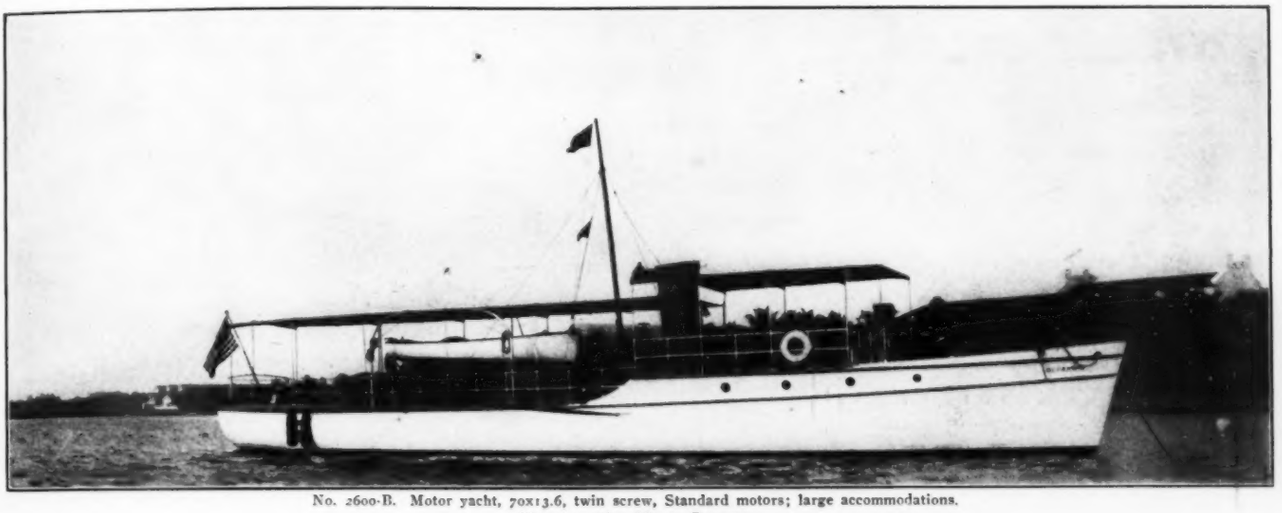
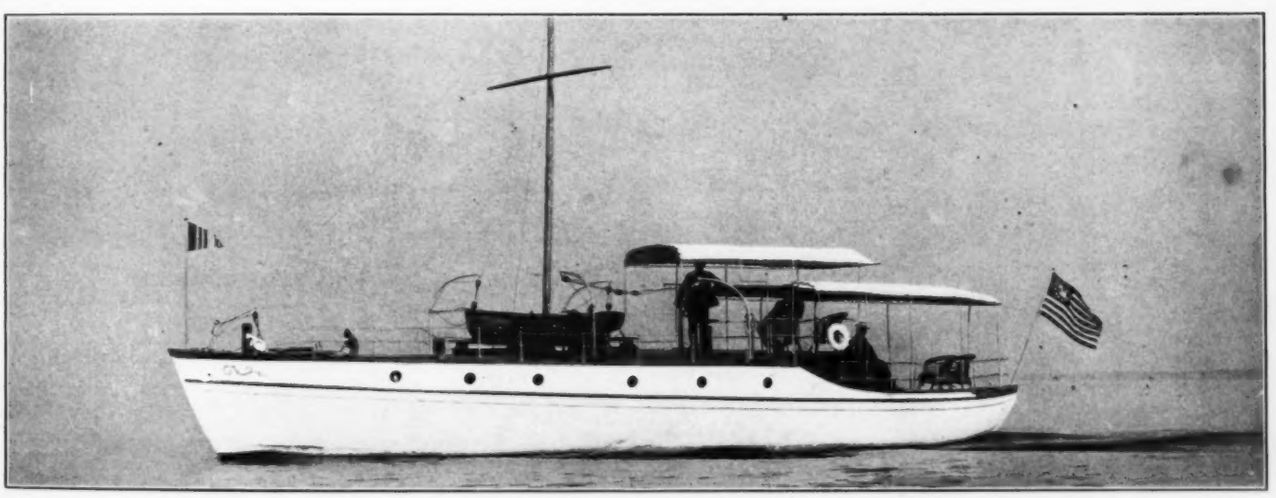
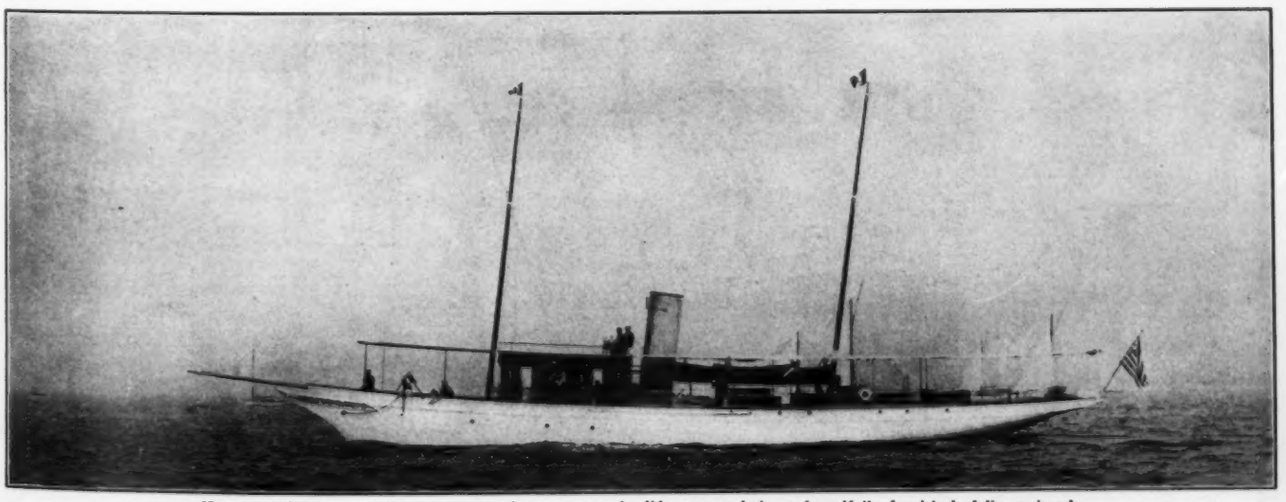


No. 2600-B. Motor yacht, 70x13.6, twin screw, Standard motors; large accommodations.
Please mention MOTOR BOATING.



No. 2596-B. To charter; roomy motor cruiser, 55x11.6; Standard motor; sleep six.
Please mention MOTOR BOATING.



No. 3014. Bargain; handsome steam yacht, 113x15; splendid accommodations; beautifully furnished; fully equipped.
Please mention MOTOR BOATING.

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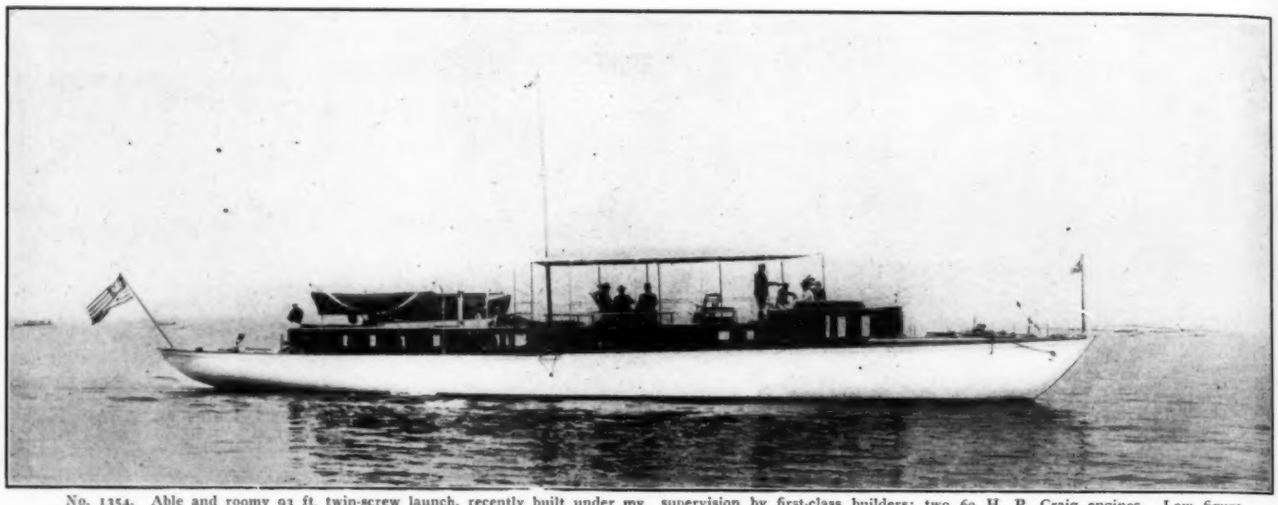
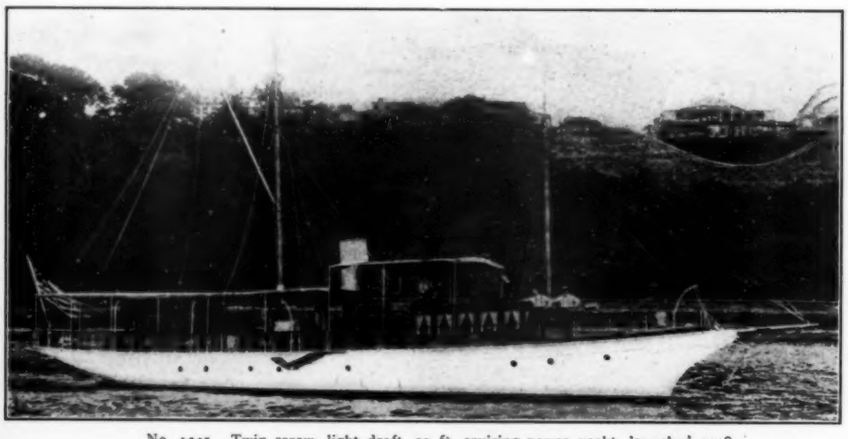


No. 1354. Able and roomy 93 ft. twin-screw launch, recently built under my supervision by first-class builders; two 60 H. P. Craig engines. Low figure.
Please mention MOTOR BOATING.



No. 1325. Twin screw, light draft, 90 ft. cruising power yacht, launched 1908.
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No. 1028. Famous long distance and deep sea cruiser, 60 ft. long, excellent motor and horse power. Owner building larger boat.
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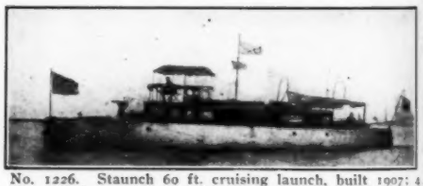
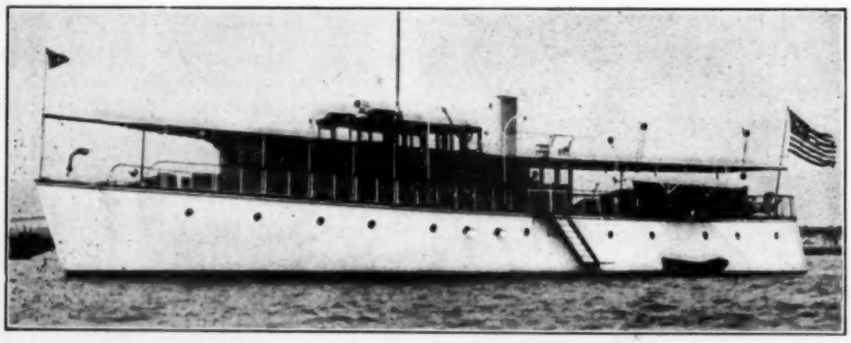
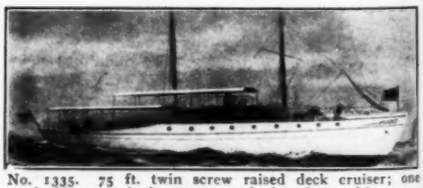


No. 1226. Staunch 60 ft. cruising launch, built 1907; 4 cylinder engine, speed 14 miles. Offer desired.
Please mention MOTOR BOATING.



No. 1238. Exceptionally roomy gasolene yacht, 125x20x6, three engines and propellers, speed 15 miles. Belongs to an estate.
Please mention MOTOR BOATING.



No. 1335. 75 ft. twin screw raised deck cruiser; one double, one single stateroom, bath, saloon with two transom berths. Price reasonable.
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No. 1318. 74 ft. twin screw ocean cruiser; two double staterooms, saloon with two transom berths, bath. Price attractive.
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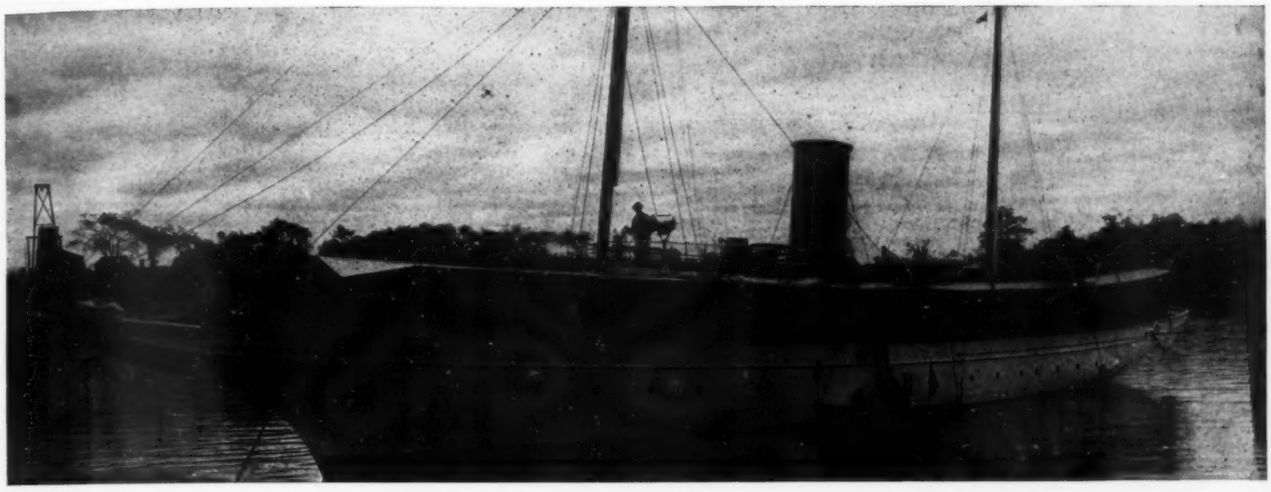
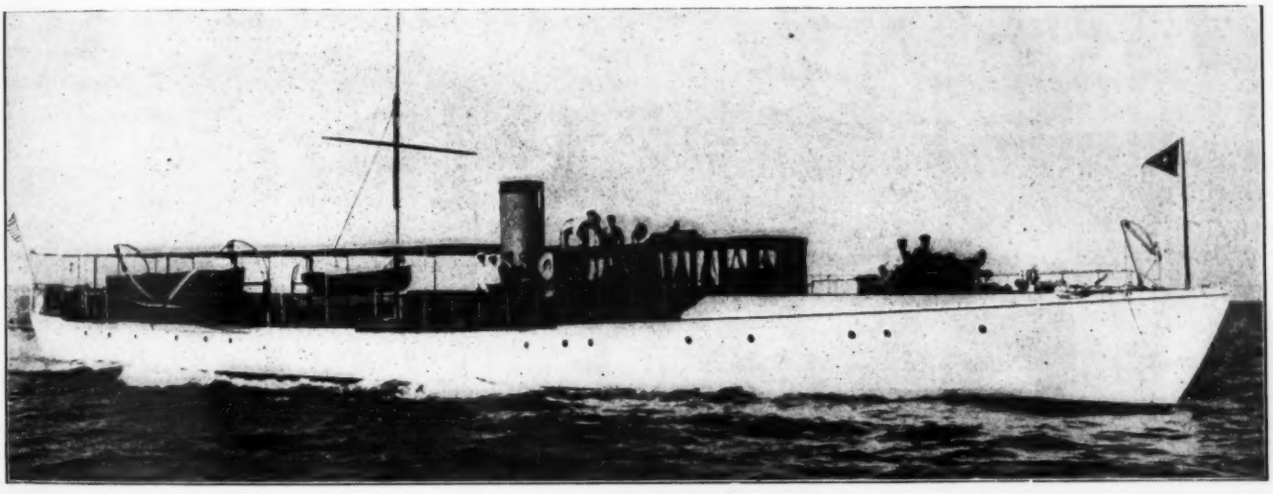
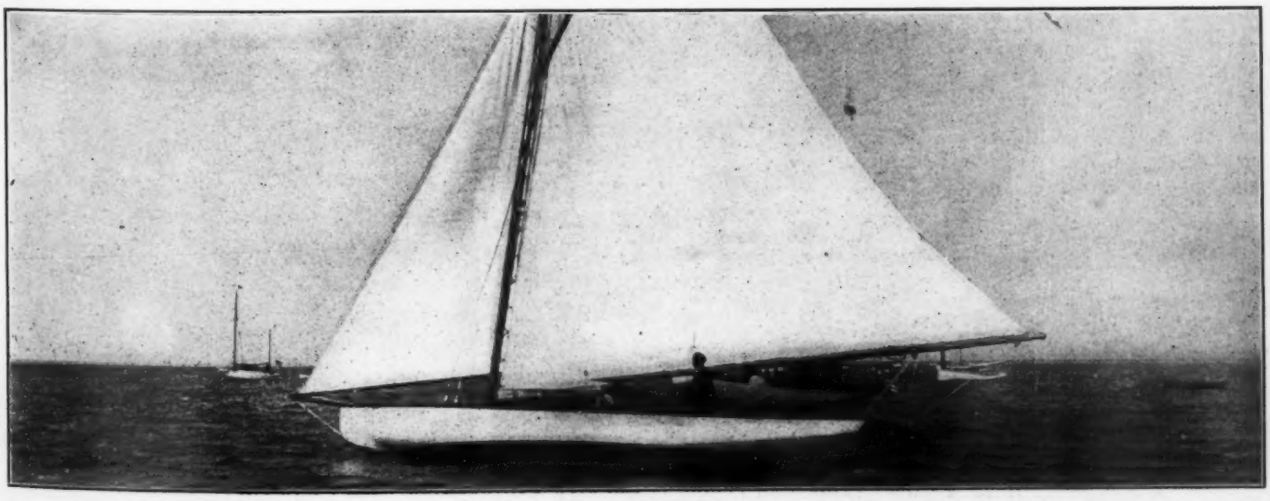


No. 3068. Strictly modern steel steam yacht, 150 ft. Two double and two single staterooms. Speed 18 miles.
Please mention MOTOR BOATING.



No. 3697. Twin screw steam yacht, 140 ft. x 128 ft. x 17 ft. x 5 ft.; speed 18 knots; fine condition; 4 staterooms; 2 baths. Asking $35,000; want offer.
Please mention MOTOR BOATING.



No. 4010. Centerboard, 40 ft. x 10 ft. x 2 ft. Lead ballast. Fastest and most stylish boat in Great South Bay. Cost $3,700 to build. Price $1,000.
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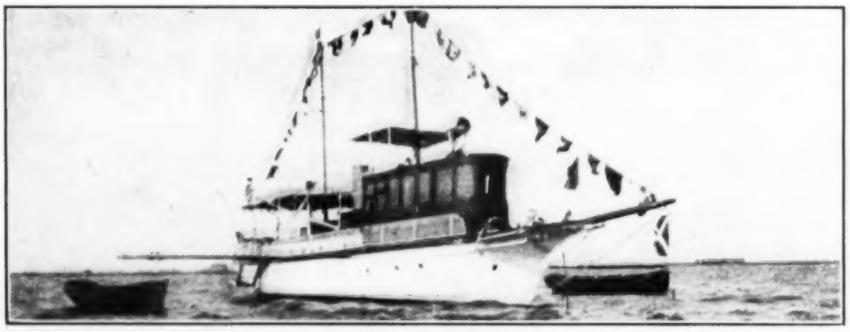

No. 1643. 65x13x4; a perfect palace; two 35-h.p. twin-screw engines; speed 12 miles. Almost any offer considered.
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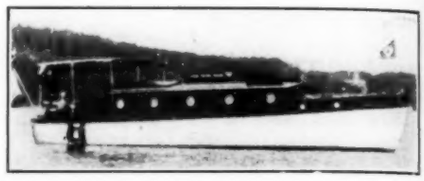
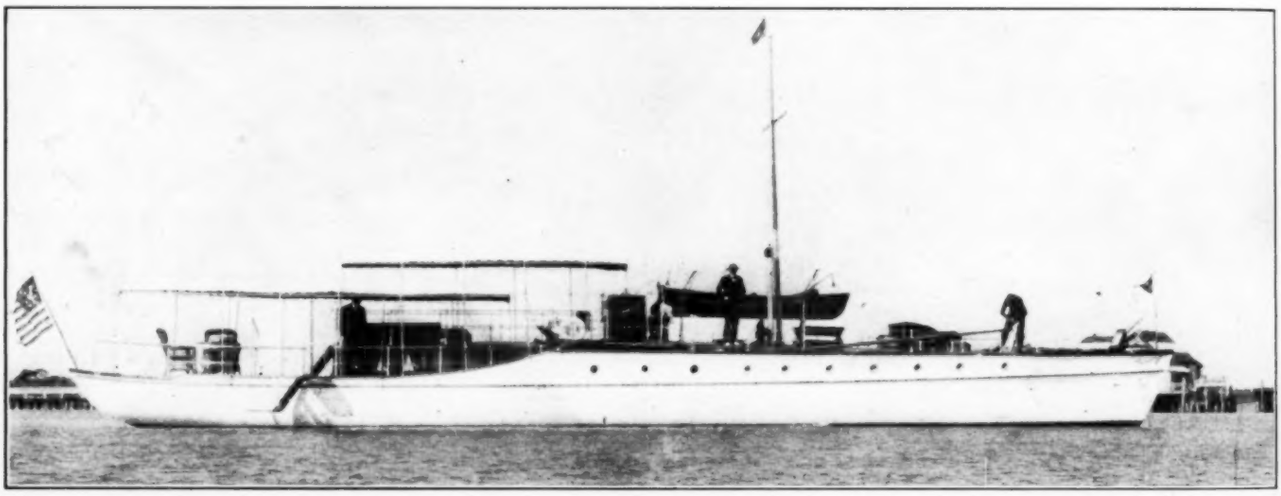
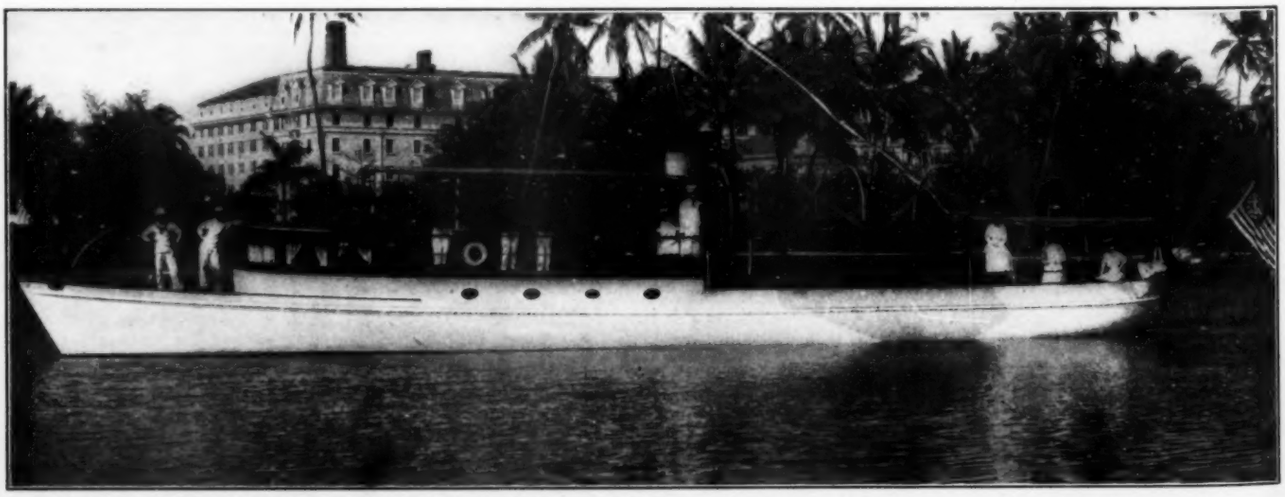


No. 1262. 40x9x3; very high class; built 1907; stateroom, main saloon, etc. 24-h.p. Lamb. Price very low.
Please mention MOTOR BOATING.



No. 562. 80x14½x4½; built 1907; 3 staterooms; large main saloon; everything desired; two 50-h.p. Standard engines; speed 14 miles. Price more than reasonable.
Please mention MOTOR BOATING.



No. 390. 80x12½x4; the handsomest yacht afloat; built 1904; has two 90-h.p. Craig engines; twin screw; speed 16 miles; will be sold at an awful sacrifice.
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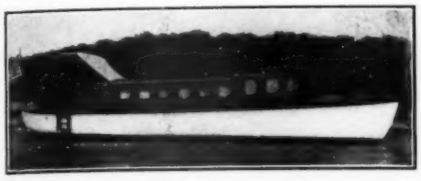

No. 1844. 42x9½x3; built 1907; a modern cruiser in every detail; 25-h.p., 4-cylinder Craig engine. Price more than attractive.

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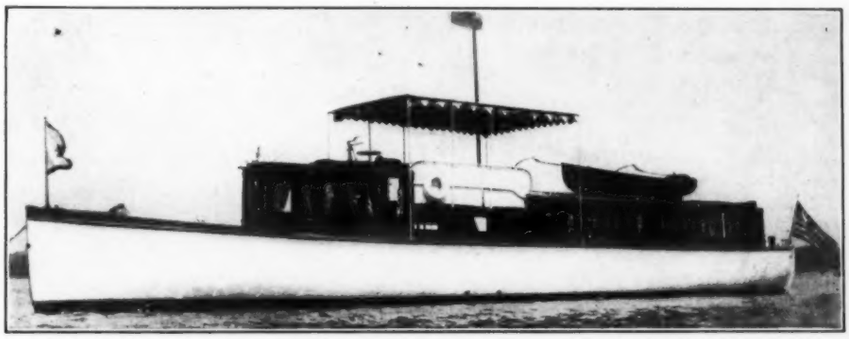
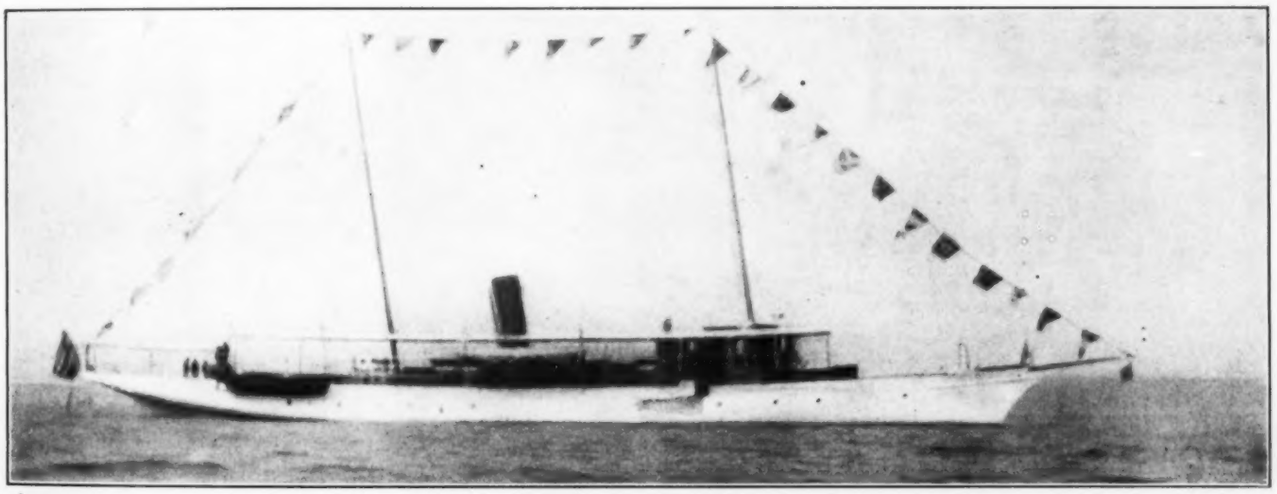


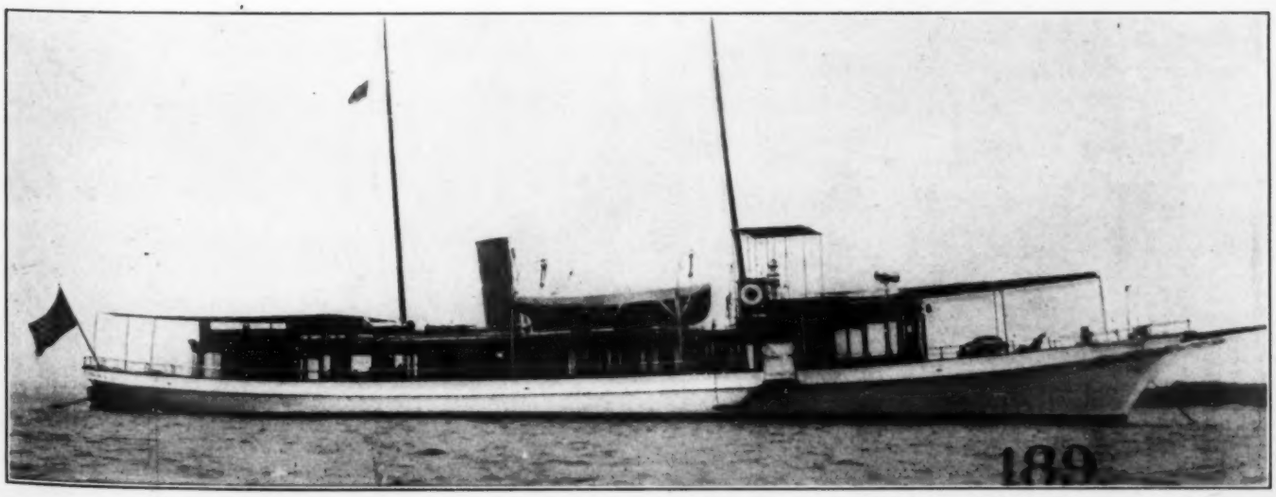
No. 1722. 62x11x30 in.; built 1907; stateroom, large main saloon, bath, etc.; two 25-h.p., 4-cylinder, 4-cycle engines, twin screw; speed 14½ miles. Price very low.

Please mention MOTOR BOATING.



No. 1284. Strictly high class steel steam yacht, 170 ft.; every luxury; speed 19 miles; offer wanted.

Please mention MOTOR BOATING.



No. 193. 85x14x3½; exceptionally fine; 125-h.p. Standard engine; speed 15 miles; price will surprise you.

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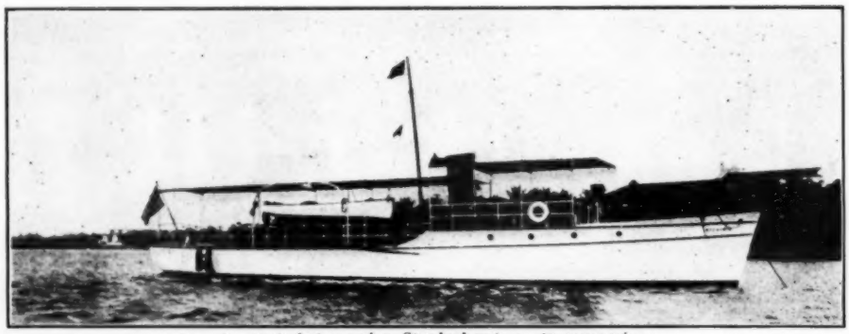
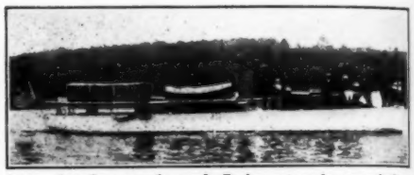
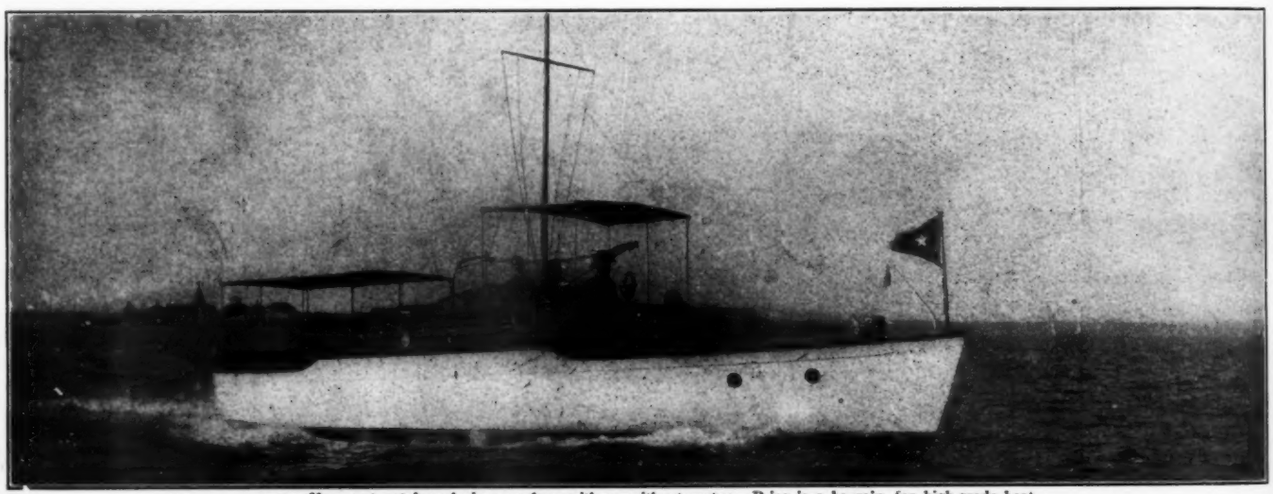


7010. 70x13.3x3.6; two 25-h.p. Standard motors. In commission.
Please mention MOTOR BOATING.

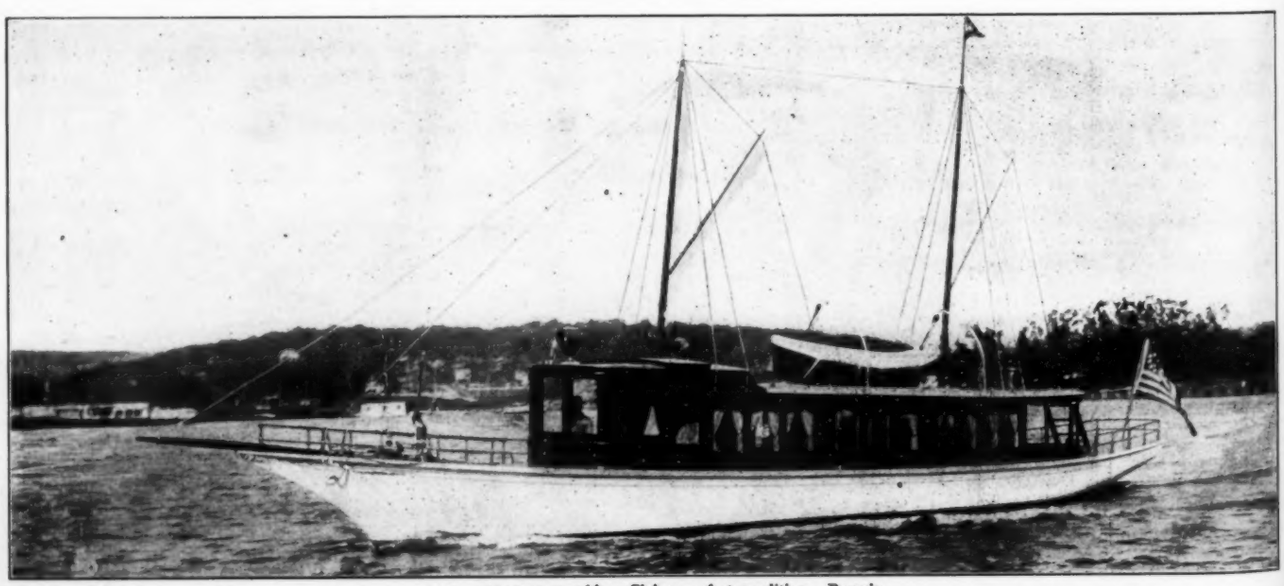
563. 35x8.10x2.6; 18-h.p. Palmer; excellent condition; good inventory; price low.
Please mention MOTOR BOATING.



6201. 61x56x10.3x2.6; 4-cyl. Craig motor; in commission.
Please mention MOTOR BOATING.



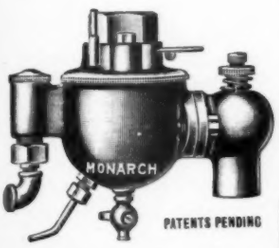
1000. **New, not yet launched; 42x9.6x3; with or without motor. Price is a bargain for high-grade boat.**
Please mention MOTOR BOATING.



9204. 50x45x11x3; 16-h.p. Globe; perfect condition. Bargain.
Please mention MOTOR BOATING.

MONARCH CARBURETOR

FOR 1910



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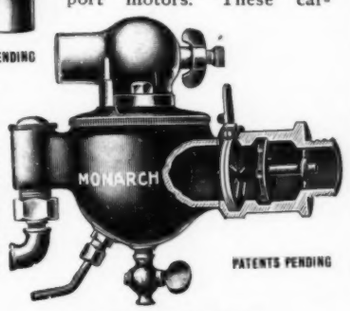
THE 1910 Models of **Monarch Float-Feed Carburetors** show some decided improvements. They are made in two models, G and H. Model G is designed for three-port single and multiple-cylinder engines. Model H is designed for two-port motors. These carburetors are of correct design, and add to the efficiency of motors using them. They are fitted with a very practical and ingenious DISC THROTTLE, interposed between the check and the carburetor.



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for Two-Port Engines

Write for full particulars, prices, etc.

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All cylinder oils come from crude mineral oils. They must be refined and filtered. Crude oil is greenish-black or dirty dark brown in color. Partially filtered oil is reddish, yellowish, or straw color. Completely filtered oil is water white. FILTRATION REMOVES THE COLOR, WHICH IS NOTHING MORE THAN DIRT—OR CARBON-PRODUCING IMPURITIES. The clearest oil is *cleanest* and will burn up cleanest in the motor cylinder.

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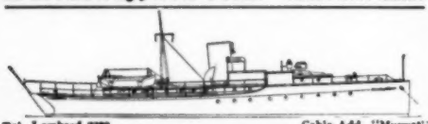

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Length 57 ft.--Beam 8 ft.--Canopy top----Triple Expansion Engine--Cylinders --5--7½--12 with 8 inch stroke. Boiler--Deering Water Tube Pressure--300 lbs. This boat would cost at least $12,000 to duplicate. Will sell for $3,000 or will exchange for one or two automobiles of that value. Address, The Hardy & Dischinger Co., Toledo, Ohio.

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WILL you exchange Motor Boat for life insurance? Address Best, care Motor Boating.

FOR SALE.—Hunting cabin launch—"Amy"—36 ft. over all; 11 ft. beam; fully equipped; Apple dynamo, electric lights, fresh water tank, toilet, etc., 15 H. P. Fulton Engine. Price $950. Address, D. E. Baxter, Sheepshead Bay Yacht Club, New York City.

FOR SALE—28 miles speed launch, 26 x 4 ft.; 50 H.P. 4-cylinder two-cycle engine. A great bargain at $575.00 on cars or in water at Muscatine, Iowa. Address Muscatine Motor Co.

FOR SALE—New 30-ft. Launch and 38-ft. Auxiliary Yawl. Miller's Ship Yard, Patchogue, New York.

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WANTED—A competent man to oversee and handle a 75-ft. cabin boat, a 45-ft. cruiser, and a racing boat, on the Great Lakes. Must be competent to attend to engines, electrical apparatus, and know navigation. A year-round situation. Address, with references, C. G. F., care MOTOR BOATING.

"WANTED: To know the address of MR. JOHN COLLER, last year with the 'Avis' of Chicago.
Address:—CARL G. FISHER, Indianapolis, Ind."

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Time has proven it a success *and,* has also produced many imitations. Ten years have proved the worth of

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It stands one year without growing grass or barnacles. It gives a racing finish as fast as pot lead.

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This is a specialty with us and it is one of the most popular and satisfactory crafts ever produced Designed and built especially for us by the leading canoe builders of America. Constructed on the most approved speed lines and very staunch. Mahogany trimmed, making it a very handsome boat; specially designed for our famous Model "K" Motor. Length 20 ft. beam 3½ ft.; equipped with 1, 2, 3 or 4 cylinder motor, or 2 cylinder motor and twin screws. **Price $300.** The demand is large and we have yet to hear the first unsatisfactory note from users It is a "goer" from the start and cuts the water with speed and smoothness; runs on the level and rides on the level. Send for catalogue with full description.

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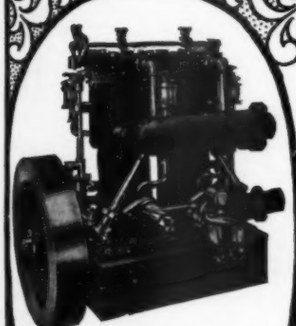

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Made in three sizes as follows:

H.P.	Bore	Stroke	Speed	Weight
5	3¾	4	650	235
10	4¾	5	630	375
15	5¾	6	525	500

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THE ROYAL ENGINE

Don't you ever "switch her off" to make a landing, to wait for another boat, to try out a fishing ground, to take a shot or for any other old thing?

How about re-starting?

You don't even have to swing the wheel of a ROYAL double cylinder engine in such cases. Just snap either of the igniter points and she will start immediately after any stop of an hour or less.

This is another feature symbolic of ROYAL efficiency throughout.

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Made in three sizes as follows:

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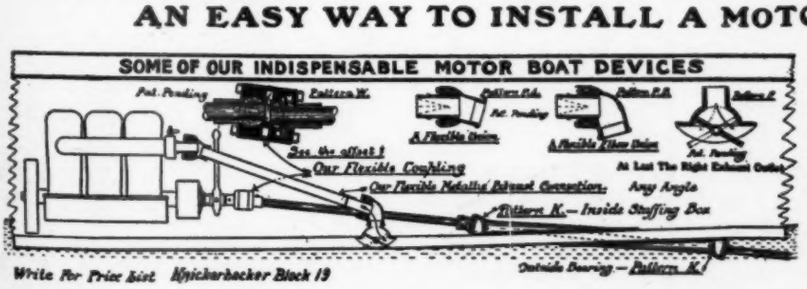

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While other manufacturers have devoted their time to perfecting the BOAT and the MOTOR, we have perfected the method of installing the engine in the hull.

In the ordinary installation the resistance of the bow of the boat against the water causes a sufficient buckling of any hull to throw the shaft bearings out of alignment and as a result causes wear and friction on the propeller shaft.

Our method of installation absolutely overcomes this and many other difficulties that cause undue wear and loss of power.

Send for printed description—" New Way to Install Motors "—today—NOW.

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Reverse Gear

CONTROL your motor boat with the reliable Baldridge Reverse Gear. Gives absolute control of your boat for starting, going ahead and reversing simply by moving a single lever.

The "Baldridge" is made in a thoroughly equipped factory devoted exclusively to the manufacture of reverse gears. The remarkable reliability of the "Baldridge" is due to correct design, accurate construction and the use of the finest steel and bronze. Over 4000 in use on boats of all kinds and every one "has made good."

We claim the "Baldridge" has a greater factor of safety than any other gear on the market—that it's the most reliable gear you can buy anywhere at any price. Let us tell you why.

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"The gear to bear the wear and tear."

THE MARK OF QUALITY AND DURABILITY

Holliday Marine Motors and Gears

have been manufactured for the past nineteen years and are endorsed by hundreds of users for their long, steady service and reliability.

Holliday Motors:
1, 2 and 4 cylinders, four-cycle, jump-spark or make and break ignition, 2½ to 40 horsepower.

Reverse Gears:
Vanadium Steel, 4 sizes, transmitting 4 to 40 horsepower.

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HOLLIDAY ENGINEERING COMPANY

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Every Boat Owner Should Send For This FREE Book

No matter how large or small your boat;

—whether it be a sail boat or a power boat;

—whether or not you've "fitted up" for this season;

—You should send today for the Hopkins' book — an infallible guide to what's right in boat equipment.

This book, — the organ of America's leading Marine Hardware establishment — represents a ten years' study of boat owners' needs.

The quality of the equipment shown is absolutely the highest—the prices listed positively closer to manufacturing cost than any others.

You simply can't afford to be without this book, which is yours for a postal. Send it now, while you think of it. Address Dept. F.

John C. Hopkins & Co.

119 Chambers Street New York

Our Patented Exhaust Prevents Backfire

SYRACUSE

Our Patented Combination Water-Jacketed Condensing Exhaust gives the Carburetor hot, dry air to produce a better mixture; cools the firing chamber to prevent pockets of steam; brings cold water in direct contact with the exhaust; causes quick condensation of gases *and thereby prevents back fire;* insures complete and positive scavenging of the firing chamber before the inrush of new gas.

Catalog 17 Free

Ask the Man Who Runs One

Great Middle Price—High Grade Motors

These points of superiority remove the last objection to the two-cycle engine and give the Syracuse more power for weight than any other motor made, because they would increase the power of *any* marine engine. This exhaust being patented, the Syracuse must necessarily lead the field. Knowing the value of these features, we accepted the Smalley challenge. For the same reason they ignored our acceptance. Write to-day and let us tell you more about these wonderful engines for light and heavy duty and speed boats.

Live Agents Wanted

SYRACUSE GAS ENGINE CO.

1803 Park Street, SYRACUSE, N. Y.

OUR TWO 1910 CATALOGUES ARE JUST OFF THE PRESS

THE ONE
Bulletin Fourteen

Treats of the K-W High Tension Magneto which is a complete Ignition System in itself. This magneto requires absolutely NO SPARK COIL and NO TIMER and NO BATTERIES of any kind, as the High Tension Current is generated in the magneto windings and carried direct to the spark plugs. The K-W High Tension magneto generates four waves per revolution of the magneto, and the heaviest engine can be started on the quarter turn, WITHOUT BATTERIES.

The K-W High Tension Magneto is designed for high speed motor boats and cars which have provision for magneto ignition and must be driven either by gear or sprocket and chain. The K-W High Tension Magneto is the only magneto made which will allow starting the engine on a quarter turn without batteries and of throttling down to from three and one-half to four miles per hour on high gear.

The K-W High Tension Magneto carries with it a Certificate of Insurance, covering it

FOREVER

against losing its power (unless battery current is run through it or the magnets are removed from the magneto, for which, of course, we are not responsible), and the size and heat of the spark never to deteriorate.

No other magneto carries such a guarantee and furthermore we agree to replace FREE OF CHARGE any part proving defective, in either material or workmanship, within two years from date of purchase.

The K-W High Tension Magneto gives a hot, fat spark on 17 R.P.M. Will positively shoot a poorer and thinner mixture than can be ignited by the most powerful battery system.

Will develop more power and greater speed than any battery system or other magneto.

K-W High Tension Magnetos will not foul sparks or allow valves to stick or pit. All wearing parts are made of crome steel, are accurately ground and lapped in place, thus insuring a maximum life. Circuit breaker and distributor can be removed and replaced at will without tools of any kind. Condenser is located right under safety gap. All windings, before assembling, are subjected to an electrical strain five times as great as they can ever be subjected to when in use, and the condenser as a whole, is tested with a high tension spark and subjected to a strain of from 20 to 30 times as great as it can be put to on the car.

Absolute freedom from breakdown on the road is guaranteed, thus entirely eliminating the necessity of the so-called "dual" ignition system. All bearings are highest grade imported ball bearings even to running parts of distributor. If this is the kind of a magneto YOU want for your high class motor boat or automobile, write us today for Bulletin 14.

THE OTHER
Bulletin Fifteen

Tells all about the K-W Low Tension Magnetos, which are used in connection with a vibrating spark coil and timer for Ignition, Electric Lights, and Combined Ignition and Electric Lights.

The K-W Low Tension Magneto acts as a powerful and reliable source of current and entirely takes the place of dry cells and storage batteries.

The K-W Low Tension magneto is designed for use on cars and motor boats which have no provision for a magneto and is driven by either belt or friction from the fly-wheel. The K-W Low Tension Magneto, when used with a K-W Coil or K-W Master Vibrator and the old coil, is absolutely guaranteed to start the heaviest engine on a quarter turn WITHOUT BATTERIES and run it perfectly at all speeds. All "L-C" models are guaranteed in addition to furnishing perfect ignition to operate powerful search lights, tail light and speedometer light, and are the

ONLY MAGNETOS IN THE WORLD

which will do so. THE K-W MAGNETO IS Guaranteed FOREVER against any loss of power (unless battery current is run through it or magnets are removed from the magneto), and any part proving defective will be replaced ABSOLUTELY FREE, within a period of two years from date of purchase. This is a year longer to look for trouble than the manufacturer of any automobile or marine engine will give you on his product.

Neither the K-W High Tension Magneto or the Low Tension Magneto require any attention with the exception of a few drops of oil every few hundred miles. They are Oil Proof, Water Proof, Dust Proof, and last but not least, Trouble Proof.

SOLD ON THIRTY DAYS' TRIAL WITH MONEY-BACK UNDERSTANDING

When you go to buy a high speed motor boat or engine and the manufacturer tells you "Oh, yes, the engine has a magneto on it—the very best, etc., etc.," just turn the switch on to the magneto, give the crank a quarter turn and see IF YOU CAN START THE ENGINE. When you find you cannot start it—as you will find in every case unless it is a K-W Magneto—refuse the "Regular Equipment" magneto which only performs half what a real magneto is supposed to do and specify a K-W.

It wont cost *you* any more, although it will the manufacturer, as we do not maintain a high list and give unfair discounts to confuse. You will then be able to start, throttle down and increase the power and efficiency of your engine, WITHOUT THE ASSISTANCE OF BATTERIES OF ANY KIND.

In addition to this you are absolutely protected by the "Certificate of Insurance" for which *we* are responsible *to you* in case of any trouble or dissatisfaction.

Think these facts over. Let them sink into your very soul, and you will have no cause to upbraid yourself for the one thing, which every man hates,—being stung. **Which Shall We Send You?**

Bulletin 14—K-W HIGH TENSION MAGNETO *or* **Bulletin 15—K-W LOW TENSION MAGNETO**

Ask about the K-W Spark Coil—GUARANTEED FOREVER

THE K-W IGNITION Co
50 POWER AVE. CLEVELAND, OHIO, U.S.A.

Ask us for a full size copy of our Certificate of Insurance. We'll gladly send you one.

THE K-W IGNITION Co
50 POWER AVE. CLEVELAND, OHIO, U.S.A.

WRITE FOR NAME OF YOUR NEAREST DEALER

YOU will count next summer's outing the most pleasant you have spent—if you spend it on lake, river or at the seashore in a Pierce Motor Boat.

For with a Pierce the pleasure of motor boating is never spoiled by a cranky motor.

Every Pierce Boat is propelled by a Famous Pierce Engine. That means much to you—because the engine is the heart of a motor boat. For 25 years the Pierce Engine has been known to expert motor boat men as the most quiet,—speedy,—dependable,—economical engine made.

But it is not the only advantage of a Pierce Boat.

All Pierce hulls are built on frames so that they do not vary from the perfect original model a hair's breadth.

Hulls and motors are built complete in our factory from AAA1 material by skilled workmen.

The 22 foot Express Type Launch shown above is a boat of large carrying capacity capable of considerable speed, built on the latest lines with brass and copper fastenings throughout, large roomy cock pits, elegantly finished Equipped with 8 H.P. Pierce Motor placed well forward out of the way of passengers but immediately accessible. The price, $700, includes complete equipment such as is listed as "extras" on other makes.

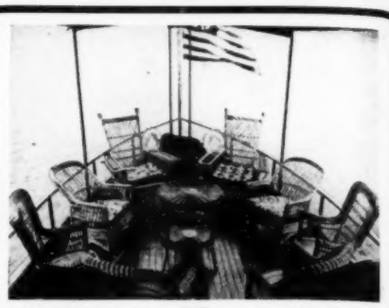
We have a boat for every need—in stock. Send for our illustrated catalog today.

PIERCE MOTOR COMPANY, 200 22nd Street Racine Wis.

14 ft. Launch Complete with Engine Ready to Run **$94.50**

16, 18, 20, 23, 27, 28 and 35 footers at proportionate prices, including Family Launches, Speed Boats, Auto Boats and Hunting Cabin Cruisers of the latest design. Sixty-four different models in all sizes ready to ship, equipped with the simplest motors made; start without cranking; ten-year-old child can run them. Boats and engines fully guaranteed. Let us send you testimonials from some of our 12,500 satisfied owners. We are the world's largest power boat manufacturers. Our free consultation department can give you valuable, money-saving information. Write today for Free Illustrated Catalog and Demonstrating Agents' Proposition. (22)

DETROIT BOAT CO., 1147 Jefferson Ave., DETROIT, MICH.



Wicker Furniture
for your boat

The furniture of your boat should be light, strong, comfortable, and *proof* against wet and weather.

Our **Wicker Furniture** is the perfection of almost twenty years in the business of manufacturing wicker ware.

All wicker furniture is *light*. Our **Wicker Furniture** is exceptionally *strong* because of peculiar features of its construction, which is fully described and illustrated in our catalog.

In design our **Wicker Furniture** is the acme of *comfort*. Furthermore, it is spar varnished, thus making it completely *proof against wet and weather*.

In spite of the unusual qualities of our **Wicker Furniture**, [fully described in our catalog], it is as inexpensive as the cheap kind.

Send for complete illustrated catalog

The Wickercraft Company

Successors to Newburgh Reed Co.

15 So. Water St., Newburgh, New York

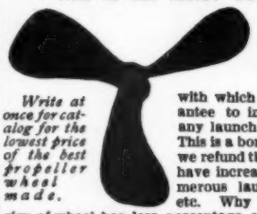
BUY AN EMMONS BOAT AND BE SATISFIED

JUST LOOK! One of these 18 ft. sail and rowing dories, complete, for $65, the safest boat afloat. Price includes boat with centerboard, rudder and tiller, sails and spars, one pair of oars and rowlocks. The same boat with 1½ H. P. motor without sails for $150.

As we can build only 200 of these boats this season, first come, first served. Send 25% of purchase money today with order and get one of the best little sailing boats ever built. Thirty-three years' experience in building these boats. We build all kinds and styles. Send 6 cts. in stamps for Catalog "K."

E. GERRY EMMONS, 53-61 New Ocean Street, Swampscott, Mass., U. S. A.

THIS IS AN EXACT CUT OF THE B & B Speed Wheel



Write at once for catalog for the lowest price of the best propeller wheel made.

with which we absolutely guarantee to increase the speed of any launch 1 to 3 miles per hour. This is a bona fide guarantee, or we refund the amount paid. We have increased the speed of numerous launches saving fuel, etc. Why not yours? Our design of wheel has less percentage of slippage than any other propeller now on the market.

BRYANT & BERRY CO., 30 West Atwater St, DETROIT, MICH.

The propeller wheels are carried in stock by our Eastern Representatives, E. J. Willis Co., 8 Park Place, New York

GET STARTED

right this season by using a plug that gives satisfaction

Price no more than others but service longer and better. Get a trial set NOW

All threads $1.00 at your dealer's or sent post-paid on receipt of price

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VANGUARD MFG. CO., Dept J, Joliet, Ill.

COOLEY SPRAY HOODS

To fit any size Boat.

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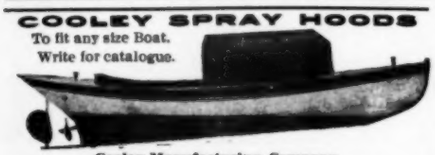

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For Pleasure and Working Boats. One to Four Cylinders. Three to Forty Horse Power. Write for Catalogue.

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You never can tell when total loss may make you a motor boat the poorer. If your motor boat is insured, the loss of the boat wouldn't mean loss to your pocket.

I specialize on motor-boat insurance at reasonable rates. Write me.

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Guarantee Against Explosion

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Will make either fast or slow boats faster and at the same time keep the boat free of bilge water automatically. Write for complete detailed descriptive circular.

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"The Best In the Bunch"

Makes boating a real pleasure by eliminating Noise! Smoke! and Smell! 1¼-in. Bronze, $4.50. 1½-in. Bronze, $5.50. All jobbers.

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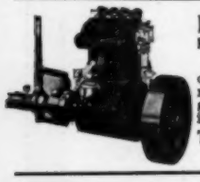
Proven Perfect for Marine Motors

EISEMANN MAGNETO CO., 225 W. 57th St., NEW YORK



FRISBIE MOTORS

Four Cycle. 3-60 H.P. 1-6 Cylinders

Simplest high-grade power plants on the market. Materials and workmanship the best obtainable. Our guarantee a liberal insurance policy.

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THE HEINZE MAGNETO

Is superior in efficiency to any other on the market

WE HAVE THE PROOF

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Single and double cyl. heavy duty motors. Double and four cyl. speed motors. Two cycle, make and break or jump spark ignition.

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GET OUR PRICES

MATHISEN BOAT CO.

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BLOW YOUR WHISTLE WITH PURE AIR

BY USING

Dixie Air Compressor

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SAMSON TILLER ROPE

Solid braided cotton with center of bronze wire. Strong and durable, and will not stretch nor rust. Send for sample.

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We've grown so large that we have to move—

So great has grown the demand for Reliance and J-D Spark Plugs that our plant in Newark has become so small we cannot make plugs fast enough—in Detroit we've purchased enough property and built a building large enough, and installed enough machinery to make all the spark plugs required for the next year—not to assemble them but make them—the porcelains included. Our location in the "Hub of the Motor World," Detroit, with the most up-to-date factory of its kind in the world, will permit us to make quick deliveries and supply the best all around spark plugs made on the face of the earth, in numbers as you desire them.

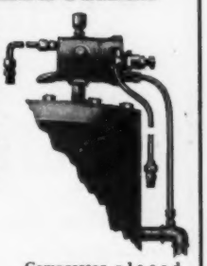
JEFFERY-DEWITT CO.
Spark Plug Manufacturers
DETROIT, MICH.
OLD ADDRESS — 232 High Street, Newark, N. J.

Its Good if made by GRAY-HAWLEY

EFFICIENT BOAT ACCESSORIES

Compressor placed on side of cylinder.

Approved by Government inspectors, and recommended by the best engine and boat builders everywhere.
Refined, Perfected and built to give Perfect Satisfaction under all conditions. The Comfort, Safety, Elegance and Pleasure of Boating is not fully enjoyed until our equipment is installed.



Compressor placed on top of cylinder.

Whistle outfits, $5 to $50. Ask for catalog Signal Dept.

GRAY GASOLENE FILTER
3-way valve permits closing off gasolene draining filter, or filling cup for priming. Screens may be removed without disturbing piping. Price $1.75.

GRAY FOG BELL No. 1
No matter how rough the sea, will not ring until you pull the cord. May be instantly removed by loosening one nut. Price, including deck plate, $2.50.

GRAY HAWLEY MFG. CO.
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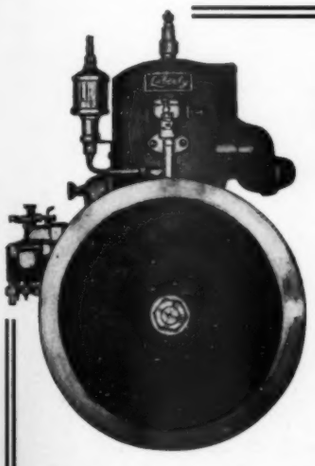

THE LIBERTY

1½ HP., 2½ HP., 3½ HP., and 6½ HP.
Single Cylinder Motors.

This is the complete Engine outfit for a $100.00 launch which you will find described in full elsewhere in this issue.

We will furnish you a guaranteed 2½ H. P. Motor for $61.50.

This includes Engine, Sight Feed Lubricator, "Schebler" carburetor, Bronze Pump, Grease Cups, Elevated Brass Timer with Reversing Lever, 10-inch Bronze Propeller, Six Feet Steel Shafting, Bronze Stuffing Box, guaranteed Spark Coil, Mica Spark Plug, Jump Spark Wire, Battery Wire, Knife Switch, One Set (6) Drycell Batteries, Battery Connections, Lag Screws, Muffler.

SPECIFICATIONS.—Bore 3¼ in., Stroke 3½ in., Weight Complete 115 lbs., Crank Shaft 1¼ in. Drop Forged Steel, Fly Wheel 12 in. in diameter, Water Jacketed Exhaust with Muffler, Brass Vertical Plunger Pump with both Check Valves enclosed, "Liberty" improved system of oiling, Propeller Shaft ¾ in., Rated 2½ H. P. at 800 revolutions per minute. Our Naval Architect department furnishes you plans for any craft you want to build. These plans and templates are of especial interest to the small boat builder. **Write for Catalog.**

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READ THIS

The Famous Michigan Speed Wheels are used on the majority of speed boats to-day. They are the fastest propeller wheels ever designed, and will increase the speed of your boat over any other wheel. They are made of the best quality of bronze, highly polished and balanced; will not break, but last a life time. We have a large selection of designs, suitable for all classes of boats. Prices ranging from one dollar upwards.

Reverse Gears. The old reliable Michigan has been on the market for eleven years and is still the leader. They are not only used on speed and pleasure boats, but the only gear adopted for ferry and working boats, owing to its simplicity of design, strength and durability. Sizes, one up to one hundred H. P. Prices, eighteen dollars upwards.

Let us give you the benefit of our long experience in selecting a speed wheel or reverse gear, by stating your requirements with full data of boat and engine.

Don't order until you have sent for our large two-colored catalog, which is full of valuable information. Sent free.

Send for No. 10 catalog and discount to-day.

Michigan Wheel Co.
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FOX MOTORS HOLD The World's ENDURANCE RECORD

1554 Miles, Cincinnati, O., to New Orleans, La., at an Average Speed of 29.08 Miles per Hour

"When You Buy a Motor, Get a Good One"

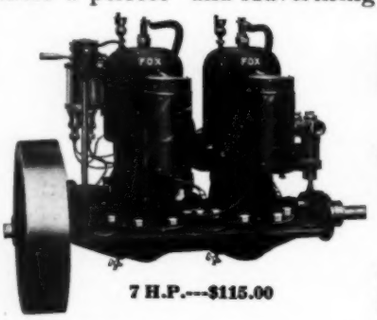
Fox Motors combine all the qualities that go to make up a motor that can be depended upon under all conditions. They have two special exclusive features.

The FOX Fourth Port Accelerator

A new patented device which produces a perfect mixture, increases the power and reduces fuel consumption in a truly wonderful manner. The weight of engine in proportion to power delivered is much reduced.

The FOX Carburetor

Is mechanically correct both for high and low speeds. Must be seen and used to be appreciated. No springs. All working parts and areas accurately machined.



7 H.P.---$115.00

Fox Motors are always sold subject to 30 days' trial in your own boat and a year's guarantee.

YOUR MONEY'S WORTH OR YOUR MONEY BACK

Fox Specials—Last Call!

We are still selling Special Motors at Introductory Prices, but these special prices will positively be withdrawn on May 1st, as announced.

If you can possibly use either of these sizes, don't miss this chance for this offer is a Bargain for you and Advertising for us.

3½ H.P. Single Cylinder at $55.00

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Remember We Build All Sizes, 3½ to 80 H. P., One to Eight Cylinders.

Write for our printed matter.

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SAFE, FAST AND DURABLE

Mullins Boats are built of smooth steel, puncture-proof plates, with air chambers like a life boat. They glide through the water easily. Cannot sink, crack, warp, open at the seams, dry out or wear out. Require no calking. Above illustration shows our 26-foot, 40 h. p. launch, with auto seats and control, in Government service. Speed, 17 to 19 miles. Price, with cushions, $1250.

MULLINS $110 LAUNCH

the lowest priced, good launch built. Our most famous model. Thousands in use. Engine, hull and fittings same quality as our larger boats. Sold under same guaranty. A staunch, noiseless, speedy, reliable launch at the lowest price ever quoted.

Greatest Values Ever Offered

Six other models, 16 to 24 feet. 3 to 20 h. p. All have 2-cycle engines that **can't backfire**, silent underwater exhaust, one-man control, inside stuffing box, outside gasoline intake, improved carburetor and reversing device, and many other exclusive features.

Complete variety of Row Boats and Duck Boats

$22.00 to $39.00

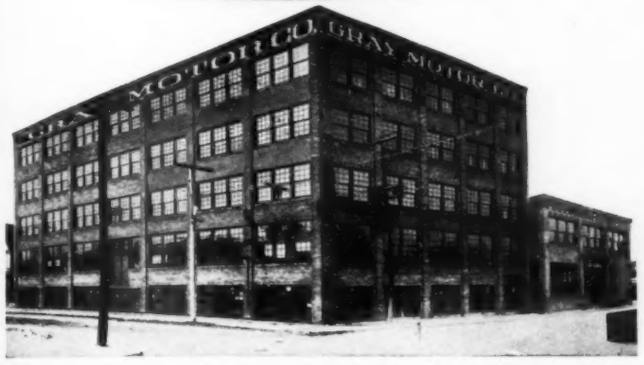
CATALOG FREE! Big 1910 Catalog describes all launches, also full line of Row Boats, Hunting and Fishing Boats, Marine Engines and Accessories. Write for it.

THE W. H. MULLINS CO., 182 Franklin St., Salem, Ohio

LARGEST BOAT BUILDERS IN THE WORLD

GRAY MOTORS

$68 COMPLETE 3 H.P. OUTFIT, *all ready to install in your boat. Guaranteed by a responsible firm. Will develop 4 actual horse power.*



Every inch of this big plant is devoted to building GRAY Motors and *nothing else*. It is the largest and most up-to-date plant in the world devoted exclusively to the manufacture of two-cycle marine motors.

We started out to make the best motors that money, skill and machinery could produce—at the lowest possible cost.

High quality and low price are usually antagonistic elements.

We had to make them harmonize.

Quality and volume of product were necessary to enable us to use rapid and modern automatic machinery.

Low price was necessary to give us the large volume of sales.

We met the issue fairly and fought it out, and won.

We equipped a truly wonderful plant.

We concentrated every effort on the ***one*** purpose—to ***build*** a ***better motor***.

We have been aggressive—keenly active—strenuous. We want your good will— your friendship—your order. We intend to ***DESERVE IT***.

If you don't use a GRAY Motor, we want you to ***know*** it well enough to say a good word for it.

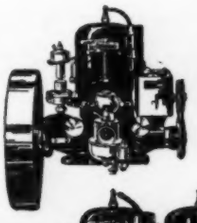
If you do use a GRAY Motor, we intend you shall have so good a motor that you will ***BOOST*** it.

For Speed, Pleasure, and Working Boats

You are safe when you buy a GRAY Motor, you will get big power, you will get prompt delivery, you will get a modern motor, you will have the plant behind it and you will get a guarantee that is absolute.

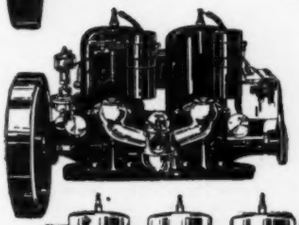
Write us and let us show you what our organization consists of; what our experience consists of; why we can give you prompt and positive delivery and why we can give you the highest quality possible for mechanical skill to produce.

ALL prices of GRAY Motors include COMPLETE outfits.



6 H. P.—power, workmanship and material absolutely guaranteed by a responsible concern. Ready to install in your boat COMPLETE.

$94 to $118
depending upon outfit.



12 H. P.—Guaranteed to develop 14 to 16 H. P. Complete outfit, ready to install in your boat.

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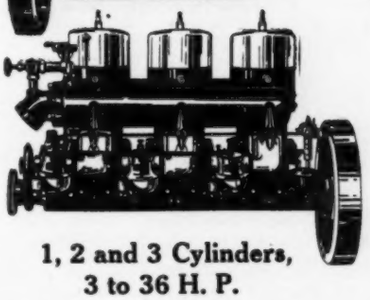
depending upon outfit.



21 and 36 H. P. Model T

Write for Special Literature.

1, 2 and 3 Cylinders, 3 to 36 H. P.

Write for big Catalog to-day—most complete marine gas engine catalog published.

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IGNITION CABLE

Solves the wiring problem on any motor boat so that it STAYS solved

THESE ARE THE REASONS *WHY:*

1. ***Highest Grade Materials*** that must meet electrical, mechanical and chemical specifications.
2. ***Superior Workmanship*** constantly checked up by the most rigid inspections.
3. ***Flexible Enamel*** which seals the rubber from heat, grease and oil.
4. ***Severe Electrical Tests*** by our own patented processes, insuring absolute freedom from failure.

INSIST on having your boat wired with *Packard Cable!*

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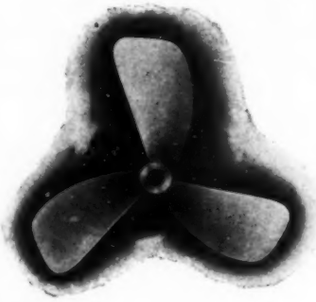
THE PACKARD ELECTRIC CO.

322 Dana Avenue Warren, Ohio

THE NEW BRYANT PROPELLER

"Can beat the best."

EFFICIENCY



DURABILITY

REASONS:

Why our propeller will increase the speed of your launch over any other wheel made.

Our wheel is true pitch ¾ the length of blade, being differential at hub **overcomes all agitation at that point.** This design of wheel gives you a shearing cut from Hub to Periphery, thereby allowing the wheel to work full length of blade, and discharging the water in a tapered volume aft, gives you all the efficiency minus a small per cent. of slip, which can only be procured by a wheel of our design. The peculiar design of a wheel of this kind requires a metal that will hold its shape, and we have a metal as **"strong as steel."**

Money refunded if we do not increase the speed of your launch.

Write for a catalogue.

MANUFACTURED ONLY BY THE

FRONTIER ENGINEERING COMPANY

836 Fort Street, West :: Detroit, Mich.

A New 35x9 Foot Truscott Cruiser

A 35 x 9 foot roomy and seaworthy cruiser, with many features that will appeal to the experienced. Members of our firm have tried out this craft in actual service,—a total of six weeks' cruising. Nothing about it that is experimental.

The 9 foot width insures a roomy boat, therefore a comfortable one. There are two sleeping compartments separated by a toilet room, the latter being accessible from either sleeping compartment without disturbing the occupants of the other. Exceptional locker and wardrobe space is provided as well as a convenient arrangement of galley and folding table.

The cockpit has a wide lockered thwart seat with high back and space for four or five rattan chairs.

The motor installation consists of a four-cylinder four-cycle Truscott 21 H. P. motor, with dual high-tension magneto ignition, mechanical oiler, etc., an ideal power for a cruiser. The control of boat and motor is in the hands of one man. Salt water equipment throughout. Mahogany and white enamel finish.

THE PRICE is exceptionally low, based on the construction of no less than ten exactly alike for 1910 delivery. Better look into this,—it offers a big value.

Our general catalogue A illustrates and describes our entire line, except above craft. Ask for special literature if interested in it.

TRUSCOTT BOAT MFG. CO.

Box 8, St. Joseph, Mich.

Branches with stock in New York, Boston and Chicago

Judge an Engine and Boat By Its History

Don't buy an engine or a boat on promises.

Don't listen to talk about what the engine will do. Find out what it has done.

Compare the actual History of the engine and boat you thought best with that of the

ROCHESTER

ENGINE AND BOATS

Find (if you can) an engine of corresponding price whose record can equal the Rochester's.

For 12 years in every content this engine has entered it has proved its surprising quality.

"She seems to be proof against trouble." That's what one racing owner says. You can't afford a faulty, "fussy" engine. It spoils all the fun. Don't make a mistake. Find out all about the Rochester engines and boats. Send for details and catalogue. Send *to-day.*

1910 models, one to six cylinders, 4 to 48 H.P. Immediate deliveries. Mechanical oilers. Atwater Kent Ignition. Gasolene or kerosene.

ROCHESTER GAS ENGINE CO.,

682 Driving Park Ave., ROCHESTER, N. Y. **1928 Broadway, N. Y. CITY.**

"DETROIT"
VALVELESS, FORCE FEED
OIL PUMP

For many years we have studied the problem of gas engine lubrication from A to Z. Behind us is the largest plant in the world devoted to the manufacture of lubricating devices. The DETROIT VALVELESS FORCE FEED OIL PUMP for motor-boat engine lubrication is the result.

It has *no check valves* to interfere with operation. Has continuous sight feed, visible from above. All mechanism except driving shaft attached to cover, facilitating quick removal for inspection, etc., without draining oil. Feed regulation simple and effective. A three-quarter turn of adjusting button changes the quantity of oil from nothing to full capacity. Height of oil in reservoir indicated by DIAL REGISTER on cover or by conventional Gauge Glass if preferred. Pistons are carefully ground. We submit the "DETROIT" as the simplest, most efficient and economically operated motor boat lubricator now made.

A VALVELESS PUMP operating with engine running in EITHER DIRECTION, therefore especially adapted to service on two-cycle motors.

Furnished in any number of Feeds and any style of Drive required.

Send for Circular No. A-64

TRADE MARK REG. U.S. PAT. OFF.

DETROIT LUBRICATOR COMPANY.

1170 Trumbull Avenue, Detroit, Mich., U. S. A

HERZ WHISTLE OUTFIT
GIVES A STRONG BLAST
SAME AS THE BIGGEST STEAMBOAT

CONSISTS OF:

1. UNIVERSAL PUMP (Driven by friction from Fly-wheel).
2. STEEL TANK (9 x 20), with all connections, including check valve.
3. BRONZE CHIME WHISTLE.
4. TEN FEET OF HOSE.

COMPLETE OUTFIT $36.50

Biggest value on the market

It's an Aristocratic Signal for Your Boat

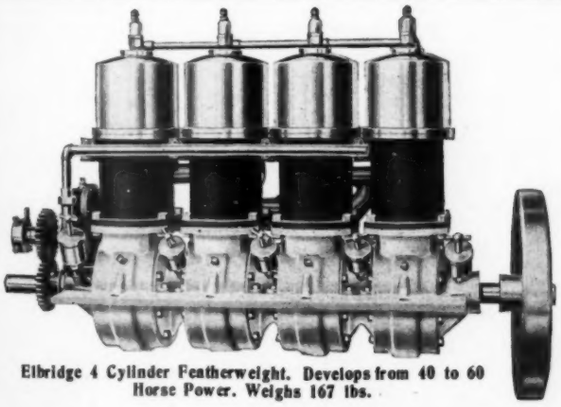
GET POSTED NOW
WRITE FOR CATALOG

Installed in a few minutes

Will last a lifetime

GUARANTEED A YEAR

HERZ & CO.
295 LAFAYETTE ST. NEW YORK, N.Y.



Elbridge 4 Cylinder Featherweight. Develops from 40 to 60 Horse Power. Weighs 167 lbs.

THE ELBRIDGE FEATHERWEIGHT

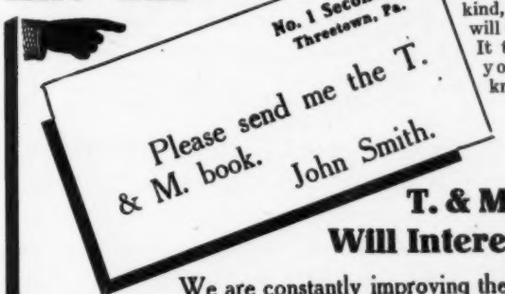
The ideal Motor for Marine or Aeronautic Navigation. The principal point to look for in any gasoline engine is reliability. The Elbridge, on account of its extreme simplicity, and scientific construction is dependable under all conditions.

Scarcely less important, if you wish to equip a speed boat, areoplane, or dirigible balloon, is the question of weight. The Elbridge stands in a class by itself in this particular. It is the lightest dependable motor as well as the most dependable light motor ever built. **It's easy to make 30-40 miles per hour in hydroplane or speed boat with the Elbridge Featherweight Engine.** Let us tell you how. Catalogue free.

ELBRIDGE ENGINE COMPANY,
Dept. M, Culver Road, ROCHESTER, N. Y.

Sales Agents for El Arco Areonautic Radiators.

Send us a postal like this—



If you are an operator of marine gasoline engines, any kind, this book will interest you. It tells things you want to know.

Our T. & M. Book Will Interest You

We are constantly improving the quality of T. & M. engines and adding new features, but **we are not increasing the price.** T. & M. Marine Engines are just as far ahead of ordinary engines as they ever were. They have been winning cups for owners for over fifteen years. They represent **quality** and **power** at the right price. You can get engines with a lower first cost, but not engines that are **lower priced for long continuous service.**

2 to 120 Horsepower

Even our smallest engines have the same T. & M. quality, the same high-grade materials and workmanship, same efficiency and reliability as our larger engines.

The dimensions are liberal, the ratings honest — the actual size and results are here, for the T. & M. Engine is sold strictly on its merits.

One feature alone, our Patented Exhaust Chamber, gives a gain of 25% efficiency on a given size of cylinder.

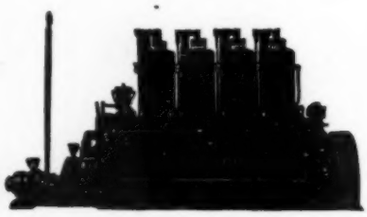
These are some of the advantages of the T. & M. Engine and they are worth your consideration as a conservative buyer.

QUALITY T & M SATISFACTION.

Termaat & Monahan Co.
Dept. C (7) Oshkosh, Wisconsin

The Reliable "RALACO"

Four years ago we gave to the motor boat world a marine engine that was at once more simple, powerful and economical than any of its predecessors. It took us 13 years to perfect this masterpiece of marine engines. But it was worth it. Today the Ralaco is the standard—the engine all *real* motor boat men wish to own. The first marine engine we ever built has run over 10,000 miles and is working yet.



What the First Ralaco Owner says:

"I have been running one of your RALACO four-cylinder, four-cycle engines in my launch 'D. E. Christian,' since 1906, and I have used this launch for carrying passengers between Kelly's Island and other adjoining islands in Lake Erie and Sandusky. I have run about 10,000 miles in all kinds of weather without one single mishap."

J. COUTCHER.

RALACO
THE SILENT SIMPLIFIED ENGINE

In another test a Ralaco ran continuously for 6½ days—24 hours each—never missing an explosion, with no attention except the replenishing of the fuel and oil supplies. Understand that there were absolutely no spare parts aboard the boat when this test was made.

YOU want an engine that will respond to any demand—from a day's outing to an ocean voyage. It must be dependable—like the Ralaco.

Send for the Ralaco Book

It's brimful of valuable marine engine information. It tells all about these famous 4-cycle engines—how they are built—what their record is. Send for it today—NOW!

The S. M. Jones Co.

Main Office, 112 Segur Ave., TOLEDO, OHIO

(6)

Varnish Cost

The varnish cost of your Motor Boat is not much compared with your other outlays, if in the first instance you pay a little more and get the best—then when your boat is varnished it will stay varnished for the season and be in good condition all the time.

Edward Smith & Company's

Spar Coating

is used by more prominent designers, builders and yachtsmen at home and abroad than any other.

Edward Smith and Company's Spar Coating will not turn white, or chip—it preserves the wood, lasts longest, and always looks well.

There is 83 years' experience in every can.

Remember it costs a little more—those who know pay it gladly because they get the best spar coating money can buy.

Use **Smith's** and your boat will be properly varnished.

FREE ON REQUEST

Winners.—Being a record of the names of the winning yachts and owners of the racing season of 1909. A postal card addressed to Edward Smith & Company, P. O. Box 1780, New York City, will bring it to you.

Edward Smith & Company

Varnish Makers for 83 Years

Main Office and Works

West Ave., 6th and 7th Sts., Long Island City

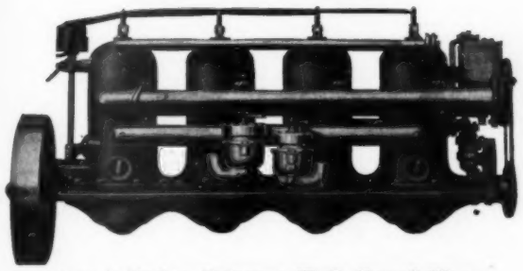
Mail Address, P. O. Box 1780, New York City

Western Branch

3532-34 S. Morgan St., Chicago

PRESERVATIVE COATINGS
E S 1827 & CO.
TRADE MARK.

GET THE VIM BOOK BEFORE YOU BUY AN ENGINE



Four Cylinder Extreme High Speed Vim

Bore and stroke—5 x 5 inches	Bore and stroke—4 x 4 inches
3 cylinder—35-40 H. P.	2 cylinder—12-15 H. P.
4 cylinder—40-55 H. P.	3 cylinder—19-23 H. P.
	4 cylinder—26-31 H. P.

The New Extreme High Speed

VIM MOTOR

The most perfect two cycle motor made

By every right, this wonderful new Vim claims —yes, demands the serious consideration of every speed boat owner.

For we have encompassed the highest ideals of gas engineers and gas engine builders.

We have brought the simple two cycle engine to a state of perfection never before attained.

The fact that this new Vim actually develops over 60 per cent more power than the ordinary two cycle of like size, and more than any other engine in the world of the same size, is significant and important.

But not more significant and important than the means by which these surprising results are accomplished.

For we have added neither weight nor complications; we have sacrificed none of the cardinal Vim virtues.

We have simply given the new Vim a patented and especially designed system of duplex ports, and two carburetors, each independent of the other and subject to the operator's control.

Thus is produced the extraordinary power and speed; thus the Extreme High Speed Vim is placed head and shoulders above all other marine motors.

If you have a speed boat, you should write at once for the particulars about this wonderful engine.

And whatever type of boat you own, you will find—if you get the literature—there is a Vim motor, exactly suited, in power and weight, to your requirements.

Write for the Vim catalogue to-day.

THE VIM MOTOR MFG. CO.

440 Market Street, SANDUSKY, OHIO

Representatives:

Southwestern New York, Connecticut and Northwestern New Jersey, OTTO GAS ENGINE WORKS, 136-138 Liberty St., New York.

Portland, Me., G. D. THORNDYKE MACHINE CO.

Central New York, W. D. DUNNING, Syracuse.

Baltimore, Md., F. B. BURTON.

Northwestern Washington, MARINE SUPPLY CO., Tacoma.

Philadelphia, Pa., W. S. CARMAN, Bourse Bldg.

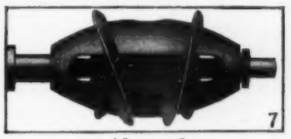
Montreal, Ont., I. L. LAFLEUR, Ltd.

ROPER Safety Propeller

Three years of constantly satisfactory use on all types of motor boats have thoroughly demonstrated the practicability of the Roper Safety Propeller. Under all conditions of service the Roper Safety Propeller has always given Perfect Speed Control.

No other propelling device or gear or combination of devices and gears can give the Immediate and Absolutely Confusion Free Response to the slightest will of the operator that is obtained by one simple throw of the Roper Safety Propeller Reverse Lever.

Full Speed Ahead.



Neutral.

EVERY OUNCE OF POWER OF THE MOTOR INSTANTLY AVAILABLE

The use of the Roper Safety Propeller holds the full power of the motor always available for use in cases of emergency. There is no waiting for the motor to pick up when it is necessary to get a quick burst of speed. There is no fumbling of throttle and spark when it is necessary to slow down. The motor always turns at the same speed and works under the same load while the propeller shaft revolves in the same direction and at the same number of turns, regardless of the speed or direction at which the boat is traveling. To obtain any speed in either direction or to hold the boat motionless, it is only necessary to throw the Reverse Lever to the position on the quadrant corresponding to the speed desired. Running ahead out of difficulties, coming to a sudden stop, stand by alongside another boat or wharf, maneuvering at any speed at any time, the absolute perfection of one lever control offered by the Roper Safety Propeller makes it indispensable to every motor boat.

BOW CONTROL. Where control is desired alongside, forward of or back of the motor the Roper Safety Propeller Bow Control affords all the perfection of control of the regular equipment.

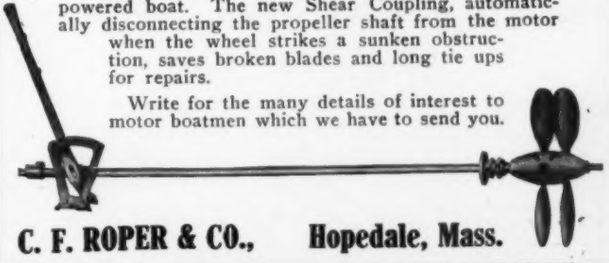
Slow Speed Ahead.

Full Speed Astern.

Write for reasons why the Roper Safety Propeller should be on every motor boat. Learn the opinion of users.

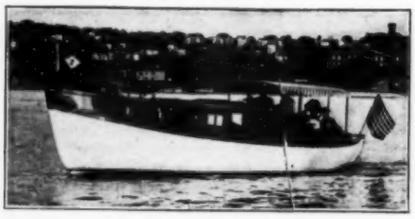
For use on speed boats the new Roper Speed Wheel is of especial interest to the owner of the fast, high powered boat. The new Shear Coupling, automatically disconnecting the propeller shaft from the motor when the wheel strikes a sunken obstruction, saves broken blades and long tie ups for repairs.

Write for the many details of interest to motor boatmen which we have to send you.



C. F. ROPER & CO., Hopedale, Mass.

"Pioneer" In Boat Construction



Stands for Durability, Strength, Seaworthiness, Beauty and Economy

Pioneer Power Boats are in use in every civilized country. We will furnish you the **COMPLETED BOAT** with the engine installed, ready to run, **or you can BUILD IT YOURSELF.**

Pioneer Perfect Frames are the standard of the world. Each rib is bent to **exact shape, fitted and beveled.** Every frame is **set up, trued, tested** and absolutely **finished,** ready for the planking before being taken apart for shipment. We also furnish in addition when desired, everything to complete the boat. With the patterns and detailed illustrated instructions that accompany every frame, you can complete a perfect boat at an **astonishingly small cost.**

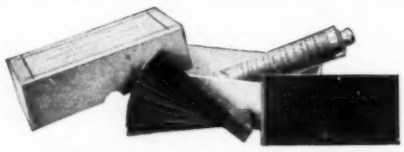
You can finish a **cabin cruiser** or a **working boat** as readily from **Pioneer Perfect Frames** as you can a small launch.

Send for our catalog, enclosing 10c. in stamps or silver to cover mailing cost. The most comprehensive book on boats ever issued, fully describing and illustrating 50 different models for both pleasure and commercial use.

PIONEER BOAT & PATTERN CO.

Box 437 BAY CITY, MICHIGAN

Carborundum



Valve Grinding Compound

Positively Assures a Perfect Valve

Made of Carborundum powders and high grade grease. Put up in two collapsible tubes—one containing coarse mixture for first rough grinding, the other containing a fine mixture for finishing.

With each outfit is a package of Carborundum cloth strips for cleaning carbonized matter from contact or vibrator points and a book of Carborundum cloth for general use about the engine.

Carborundum powders are hard, sharp, quick cutting—produce a positively true contact seat.

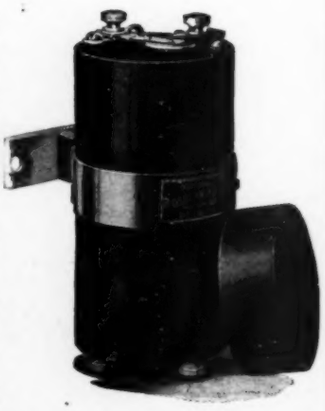
For those who prefer to mix their own compound, the dry powders are offered in half pound tins. The powders can be mixed with any good grease or light oil.

Outfit containing two collapsible tubes, cloth strips and booklet, packed in neat cardboard box, complete.....75c
Outfit containing two half-pound tins, coarse and fine grain, cloth strips, booklet, packed in neat cardboard box.....75c

THE CARBORUNDUM COMPANY
NIAGARA FALLS, N. Y.

OSBURN COILS

THE above cut shows our fibre case coil. As it is secured to the cylinder, the saving in secondary cable is considerable. The current consumption is small (batteries last again as long). The points, as on all of our coils, are platinum with 15% iridium. The cover keeps dirt and moisture away from the vibrator.



You take absolutely no chance with Osburn Coils, as the secondary windings are guaranteed FOREVER against break-downs, and we will replace free and without charge any coils which do.

Sold on thirty day trial with money-back understanding

Write for Catalog showing complete line

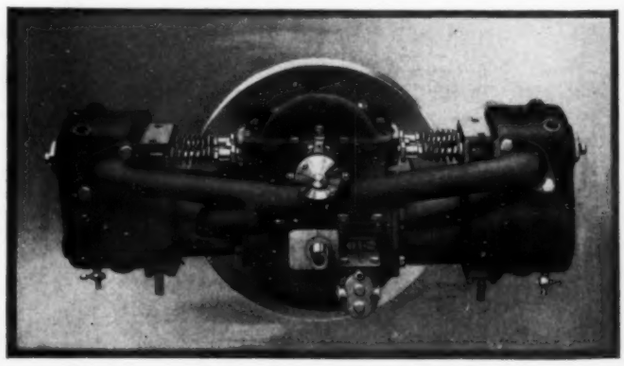
OSBURN ELECTRIC COMPANY

70 Fort St., East **Detroit, Mich.**

Northwestern Distributors
J. C. Shadegg Engine Co.,
Minneapolis, Minn.

New England Distributors
Atlantic Maritime Co.,
Boston, Mass.

BEILFUSS MARINE MOTORS.



Of the two cylinder opposed four cycle type.

The Motor which is surprising the boat owners in every locality wherever introduced, on account of their *compactness* (can be placed under seat if so desired), *economy* of fuel consumption, *non-vibrating* qualities, and their perfect *reliability*. When supplied with a good spark and plenty of gasoline they will run until stopped.

The owners of Beilfuss Motors are our best advertising medium. Why? Because they cannot say too much in their praise.

Write for circulars describing our 1910 style motors.

Thousands of unsolicited testimonials on file to prove the above claims.

BEILFUSS MOTOR CO.,

704 Saginaw St., E. **Lansing, Mich.**

ANTI-CRANKING FEATURE — *It's New*

ANOTHER LACKAWANNA SIMPLIFICATION

RESULTS! From France

Bordeaux, France, May 19, 1909.

Lackawanna Mfg. Co.,
Newburgh, N. Y.

Gentlemen:—

We have much pleasure in sending you two photos of a "tillole," 35 feet long, fitted with one of your 15 H. P. double cylinder motors. The boat is used for sardine fishing. On the whole we have had satisfaction from these engines and regret to have no better photos to illustrate them in use here.

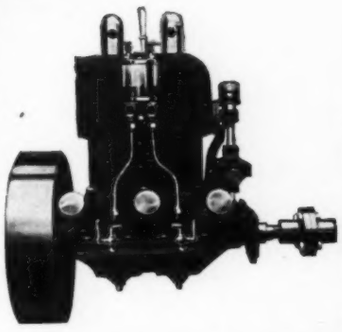
Maisoneth Pilter.

LACKAWANNA VALVELESS MOTORS

The World's Simplest

Built for Heavy Duty, Medium or Speed Work

We originated and put on the market the first practical successful three port, two-cycle marine motor—The Lackawanna Valveless Reversible. Since 1898—twelve years—we have been steadily building, perfecting, succeeding with **the one type.** Every Lackawanna motor turned out by the one factory has given excellent service—many of them after constant use dating back ten years—of which we have record—are in active **satisfactory use to-day. Passenger—Working—Fishing—Cruising and Speed Boats.**



THE DOUBLE CYLINDER MODEL

Balances Impulses — Increases Power

We built the first successful double cylinder two cycle marine motors, which owing to the peculiar construction, have been a success from the start. The effect of increased torque, one cylinder helping the other, actually increases the power per cylinder. (They are fast supplanting the single cylinder motor.)

The "en-bloc," one piece cylinder construction, results in increased efficiency, perfect cooling, economy of gasoline, freedom from vibration and long life. Our motors are **guaranteed.**

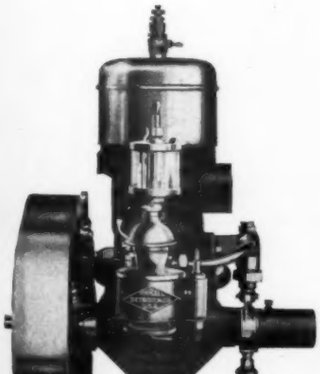
Built in one, two, three, four and six cylinders, 2 to 45 Horse Power PER MOTOR, EITHER Jump or Make and Break low tension spark for battery or magneto; also **electric light, pumping, refrigerating, and stationary motor plants.**

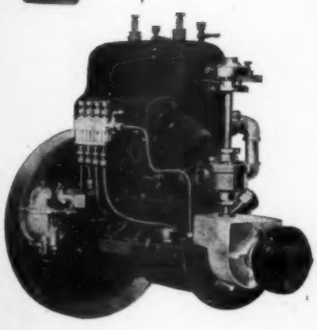
Perhaps it would be well to get our complete "Marine Motor Book," explaining the operation of boat motors from Intake to Exhaust. Fully illustrated, also with latest practical boat equipment details.

Sent Free to any part of the world. Write for it to-day.

LACKAWANNA MFG. CO., **31 Coldwell St., NEWBURGH, N. Y.**
NEW YORK BRANCH, 126 Liberty St.

BOSTON BRANCH, 65 Beverly St.
PHILADELPHIA BRANCH, 2011 Market St.
CHICAGO BRANCH, 76 Wabash Ave.





Install a THRALL Refined Motor to Get Utmost Speed and Service

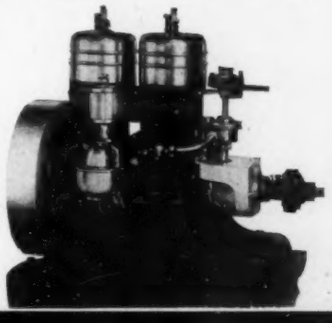
Thrall Motors make the fastest boats in the world.
Read what Mr. Chas. W. Adams, of Boston, Mass., writes:

"'The Limit'—is equipped with a single cylinder, 3 H. P. Thrall Refined Motor. From all data which I can gather, she is the fastest boat of her size and power in the world. We have an absolutely accurate mile (measurement taken on the ice, with a steel tape), and this wonderful little motor has driven 'The Limit' 14 miles per hour many times. I am willing to back her for fun, money or a cup, as the fastest boat of her horse-power in the world. You are at liberty to use this letter in any way you like."

But speed isn't the only advantage of Thrall Motors. Refined metal and construction mean light weight, economy in use of fuel and oil, simplicity, durability and endurance. The Thrall 3 H. P. has a record of endurance of 310 miles in 25 hours and 10 minutes in a 24 ft. boat. Yet this motor weighs only 60 lbs., proving that weight is not necessary for speed, power, endurance or durability. Thrall Refined Motors are made in

SINGLE AND DOUBLE CYLINDER—3 to 12 H. P.

Buy a good motor. For only a good motor—a Thrall Refined—will "keep you ahead" during years and years of use. Don't buy *any* motor till you investigate the Thrall. Let us tell you of its many real points of advantage. You must know them, in order to learn all that is best in motor construction.



WRITE NOW FOR BOOK

Just send your name and address on a postal. We'll send you the testimony. What Thrall Refined Motors are doing for others, they will do for you. Don't delay—Write now. For soon you will want to be skimming along the waters. Let us send you all the proof that a Thrall Refined is the Motor you want. Address NOW.

THRALL MOTOR CO. 2 to 38 Twenty-first St., DETROIT MICH.

A MOTOR GUARANTEED FOR AN UNLIMITED TIME

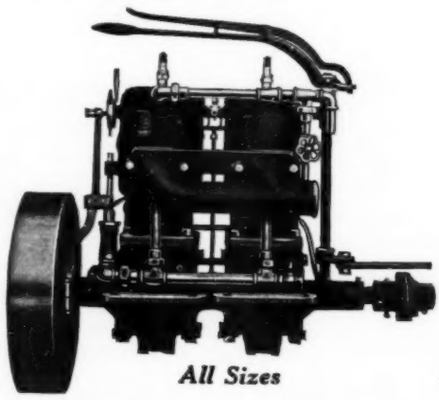
The Tuttle

WE GUARANTEE it to be right, as far as it is humanly possible to have it, before leaving our shops. If it does not prove to be so, we stand ready to make good any defect not caused by carelessness or abuse.

You Can Now Purchase a TUTTLE Motor for from 20% to 30% Less Than Heretofore

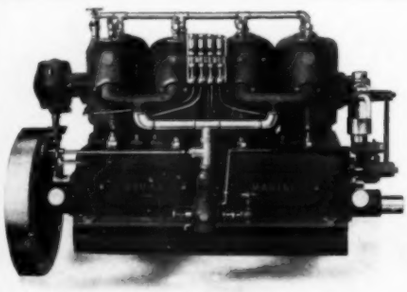
because we have done away with the old-time method of selling through salesmen, and have adopted an up-to-date plan of dealing direct with purchasers.

All commissions having been deducted, you can now equip your boat at an extremely low cost. Write for catalogue and full information. It will pay you.



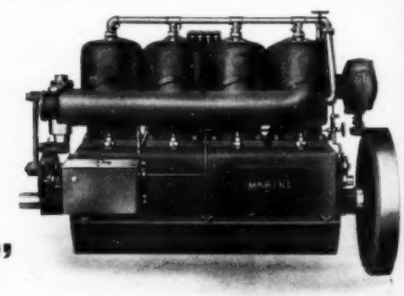
All Sizes

D. M. TUTTLE CO.,
34 Holden Street, :: Canastota, N. Y.
Boston Office: 70 Long Wharf
Metropolitan Office: City Island, New York



DOMAN

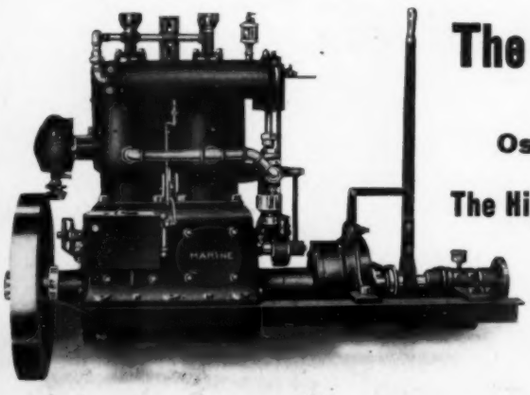
"The Motor of Quality"



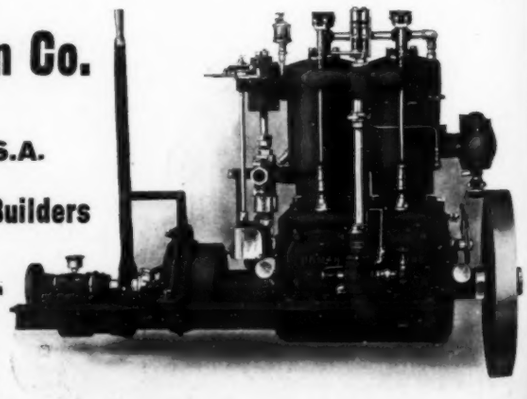
Port View, 30 H.P. four cylinder Doman Marine Motor

Starboard View, 30 H.P. four cylinder Doman Marine Motor.

We have been building Marine Gasoline Motors and Engines of the four cycle type for the last fourteen years. We build them in sizes from 5 to 200 H.P., 2 to 8 cylinders. They are the product of a gradual refining process. In their present state they approach the highest degree of development in the marine construction line. It means that you secure power that will give you satisfaction at *all times*. In short quality through and through. Write for catalog.



The H. C. Doman Co.
Dept. "F"
Oshkosh, Wis , U.S.A.
The High Grade Engine Builders
Western Stock Branch
Seattle, Wash.
72 Jackson St.



Port View, 20 H.P. two cylinder Doman Heavy Duty Marine Engine.

Starboard View, 20 H.P. two cylinder Doman Heavy Duty Marine Engine.

Some DURKEE Specialties
FOR YOUR MOTOR-BOAT

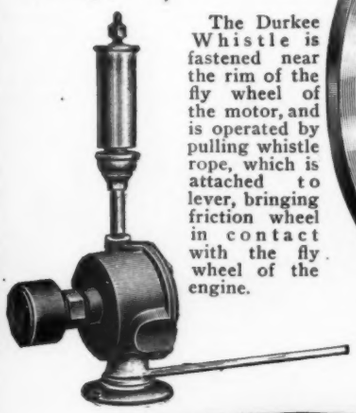
The New Durkee Bilge Pump
(Patent Pending)

is a distinct improvement over the other kind which looks so much like it. The length of hose which serves as an in-take allows the foot rest of the pump being placed on a locker, seat or deck, which means that the operator is not obliged to put a twist in his back to clean out every drop of bilge water. For washing decks and cleaning off an anchor on moderate-sized craft, the ease by which the in-take hose may be dropped overboard while the operator is standing on the deck is a mighty taking feature.

THE NEW DURKEE BILGE PUMP

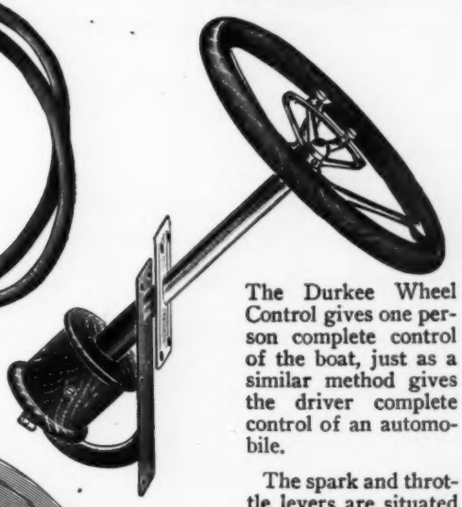
The Durkee Power Whistle

gives a long, continuous blast or a series of short, sharp blasts—at will—and has great distance and penetrating power.



The Durkee Whistle is fastened near the rim of the fly wheel of the motor, and is operated by pulling whistle rope, which is attached to lever, bringing friction wheel in contact with the fly wheel of the engine.

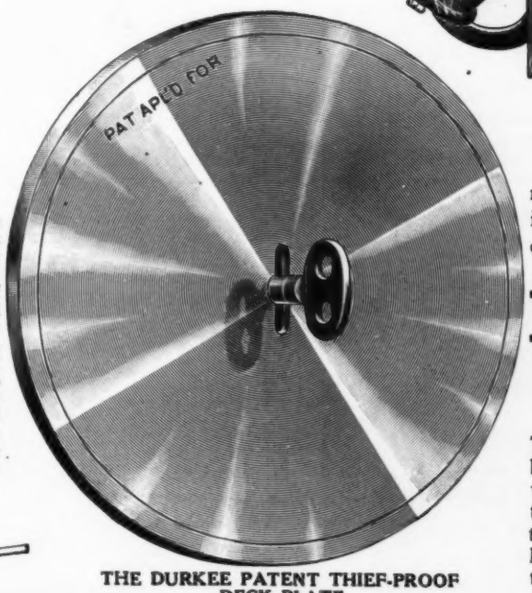
The Durkee Wheel Control



The Durkee Wheel Control gives one person complete control of the boat, just as a similar method gives the driver complete control of an automobile.

The spark and throttle levers are situated within the rim of the steering wheel.

This method of control is the most satisfactory way of keeping in the hands of one person the operation of a motor boat.



THE DURKEE PATENT THIEF-PROOF DECK PLATE

The Durkee Patent Thief-Proof Deck Plate

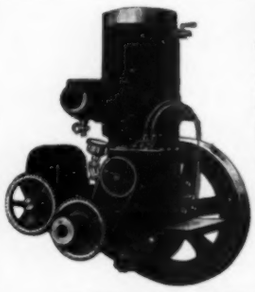
There are two ways to open it—by a key or a jimmy. The fellow who steals gasoline can't follow this calling if you have one of these Deck Covers. You have the key. He may have a jimmy, but to work a jimmy makes a lot of noise.

THE DURKEE PATENT KEYLESS DECK AND HAND HOLE PLATE

The Durkee Patent Keyless Deck and Hand Hole Plate

The Cap of this Deck Plate may be inserted without the use of a key of any kind. Instead of a thread to hold it in place, a couple of springs, actuated by studs in the flange of the cap, fit into a groove in the plate, and it may be inserted or removed instantly. This plate, in the 4-inch size, makes a particularly good hand-hole plate for covering the supply valve at the gasoline tank, which in many open craft can be approached only by removing the portable bulkhead.

C. D. DURKEE & CO., 2 South St., New York



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CACO ADJUSTABLE CHIME $5.00

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IT'S THE CACO MAKES HIM SMILE

BECAUSE IT MAKES MORE NOISE THAN THE OTHER FELLOW'S WHISTLE

CACO AIR WHISTLES

ARE GUARANTEED to produce a deeper and MORE PENETRATING tone than ANY other whistle made.

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METAL AND WOODEN LAUNCHES OF ALL DESCRIPTIONS.

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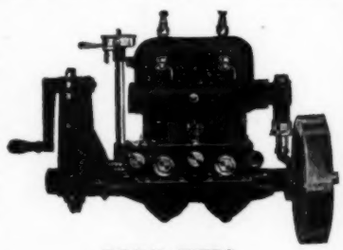

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230-50 HORTON STREET, JACKSON, MICHIGAN, U. S. A.

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"WOLFF II" Champion of the Pacific Coast averaged 32 miles per hour official time. On February 6th a Columbian Speed Propeller increased her speed to 33¼ miles per hour. An increase of 1¼ miles after she had tried every make of propellers on the market.

What a Columbian can do for your boat

No matter how little power you have it will add speed to your boat. Write for "Propellers in a Nutshell."

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We show you how and you will enjoy building your own boat from frames or patterns by our method. We supply you with frames you can assemble without boring a hole or cutting a shaving.

Our "NIAGARA QUALITY" frames are years ahead of all others. They are designed by the best naval architects and are perfect in every detail. Our models, in competition, both for speed and seaworthiness, are considered by owners everywhere to be the best in the world.

SAVE HALF THE COST

"Boats in any stage of construction," from patterns to completed boats ready to put in the water and run. Let us show you what we can do. Your interests demand a copy of our catalogue. Send 5c. for mailing. It means money and satisfaction to you. Write us.

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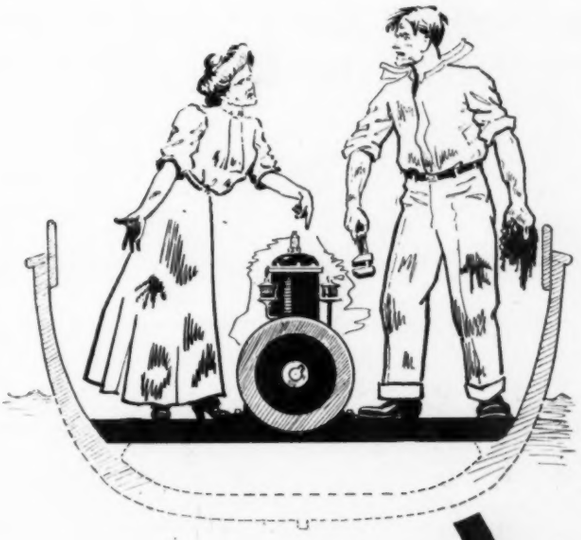
SINTZ

2 and 4 Cylinder Opposed Marine Motor. Sizes 6 to 40 H. P.



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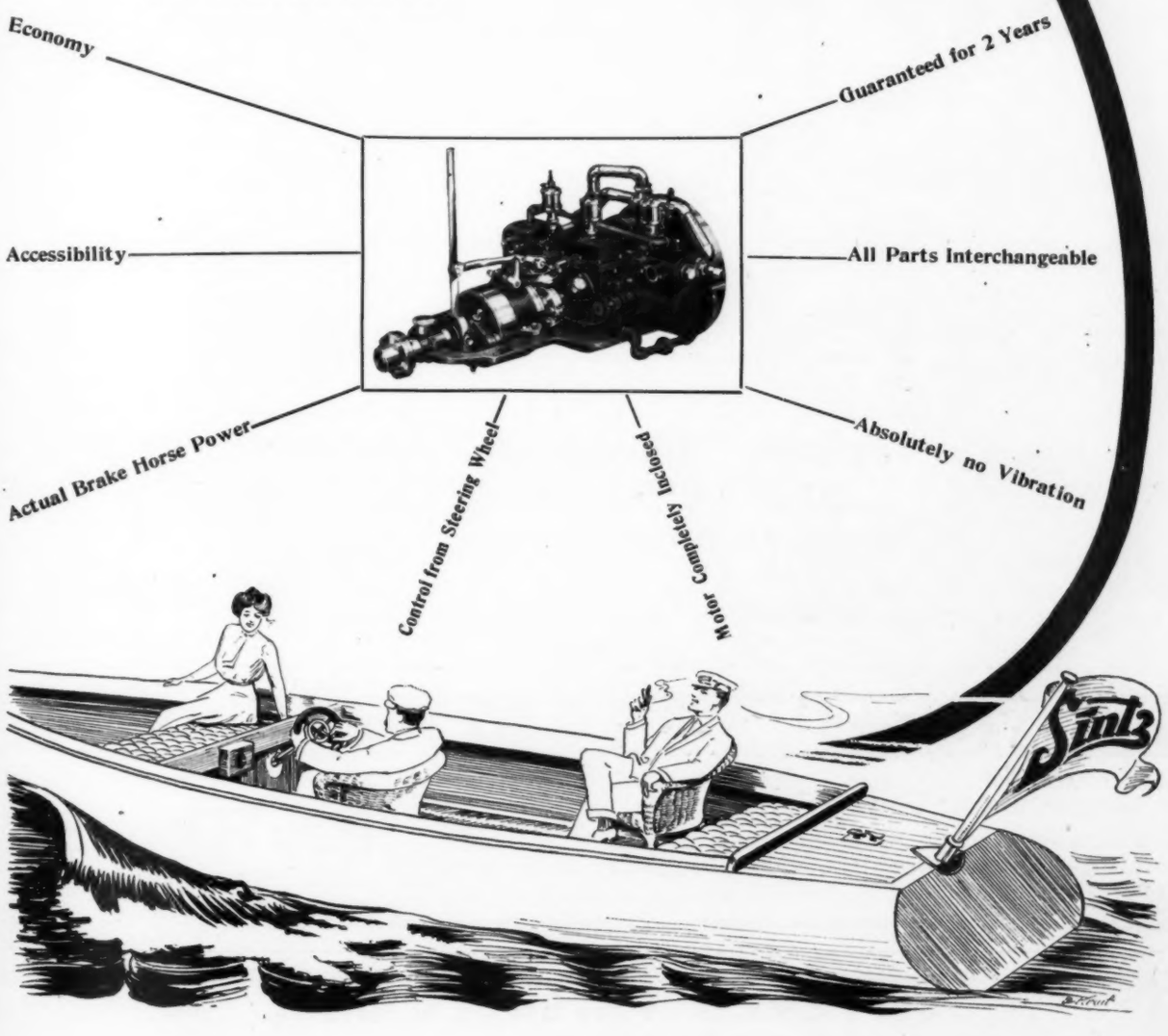
GUY L. SINTZ CO., Desk B., MARSHALL, MICH.

No noise but the ripple of the wheel



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Operated by the cooling water after it leaves the engine cylinder.

No moving parts.
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Nothing to wear out.

Pumps sand or grit out of bilge.
Positively automatic.
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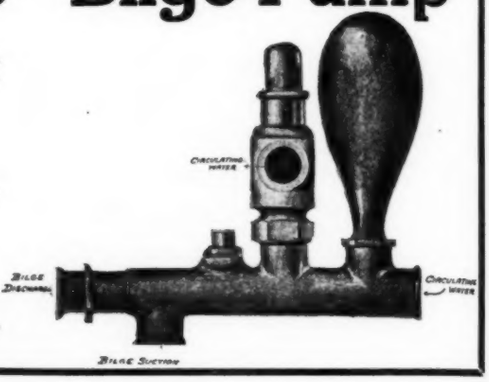

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are made of the best cedar, ribs and planking covered with canvas; spruce gunwales, white ash or oak stems and thwarts and brass-bang plates. The seams are beveled and lapped, making a smooth water-tight canoe, even before the canvas is put on. No cracks, no swelling or shrinking and the result is a stiff, strong, durable canoe. Ask for our descriptive booklet.

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For DECK and all other SEAMS

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Weather checks, Floors, Bedding and Glazing of Skylights, Conservatories, Pointing of Stone Work, in fact, in all places where a perfectly tight joint is wanted, use **Elastic Seam Paint** and **Elastic Seam Composition.** The *Elastic Seam Composition* is made in white, black, gray and yellow, and to order in all colors.
Send for new booklet. Sample sent on receipt of thirty cents in stamps

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The whitest gloss white in existence. Works as smooth as oil paint. Dries in from 6 to 12 hours. Withstands acids and gases, will retain its gloss the entire season. Can be touched up any time without showing. One coat over a coat of *Elastic Flat Yacht White* will last all season. **Price, $4.00 a gal.; $2.00 a half gal.**

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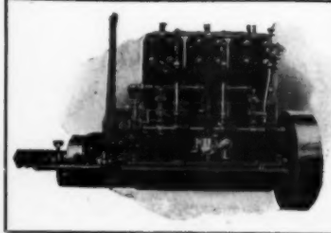

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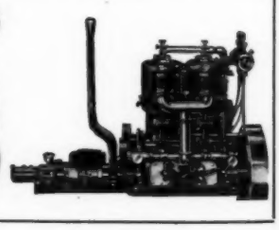

THE HYDE "TURBINE TYPE" PROPELLERS

will add more speed to your motor boat, no matter how fast it is now.

It is designed and built to do just that thing---to give the motor the best "grip" on the water.

It is made of Manganese Bronze of the highest tensile strength.

Let us tell you about the Hyde Propellers and describe the special advantages of their design.

Write for catalog and price list

HYDE WINDLASS CO.
BATH, MAINE

JEFFERY'S PATENT MARINE GLUE

Use No. 1 Extra Quality for deck seams of Yachts and Motor Boats.
Use No. 7 Soft Quality or Waterproof Liquid Glue for filling and waterproofing canvas for covering Boats and Canoes, Cabin Tops and Decks.
For sale by all Yacht, Boat and Canoe Supply Houses and Sporting Goods Dealers. Send for samples, specimens, circulars, directions for use, etc.

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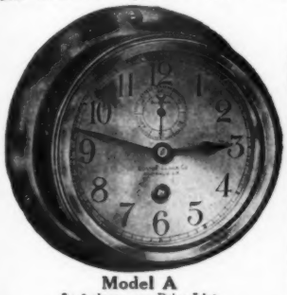
QUALITY and PRICE UNAPPROACHABLE

THE 8-DAY HIGH GRADE **BOSTON** AUTO CLOCK

FOR AUTOMOBILES AND MOTOR BOATS

The illustrations below show in Reduced Size the General Style of the Various Models of **The "BOSTON" 8-DAY HIGH-GRADE AUTO CLOCK**



Model A
In 3 sizes—see Price List

Model B
In 3 sizes—see Price List

Model C
Adjustable to various angles by Ratchet and Nut at back. In general appearance it closely matches many makes of speedometers. In 3 sizes—see Price List.

Model D
In 3 sizes—see Price List

Secured to Dashboard by Safety Locking Device.
Model E
In 3 sizes—see Price List

The Illustrations below show the (patent applied for) STEM WINDING and STEM SETTING Device

On Models A, B and C it projects through side of case. On Models D and E it projects through bottom of case and eliminates seconds dials. Compact and effective. IF CLOCKS wanted FITTED with this device, ADD $2.50 to Price Lists.

PRICE LIST

SIZE	MODELS A, B, C	MODEL D	MODEL E
3-inch.....	$15.00	$18.00	$21.00
3½-inch.....	16.50	21.00	24.00
4-inch.....	18.00	24.00	27.00

☞ Add $2.50 to above prices if want fitted with the stem wind and stem setting device.

In ordering, state the model and size wanted.

The movements are 8-day, high-grade, very rigidly built, are 7-jeweled and have Breguet hairsprings and compensation balances with timing and balance screws, etc., and are secured by screws through back of case—the best possible way.

The cases are of the approved "screw bezel," water and dust proof type and are made of polished brass, but "to order" will be finished Nickelled.

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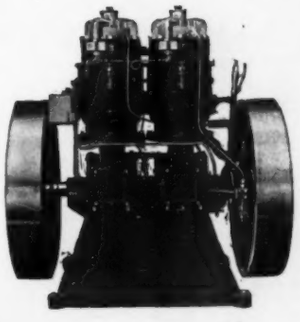
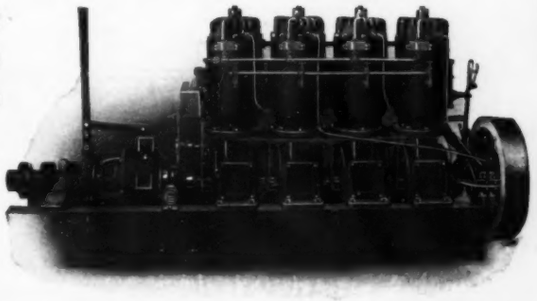
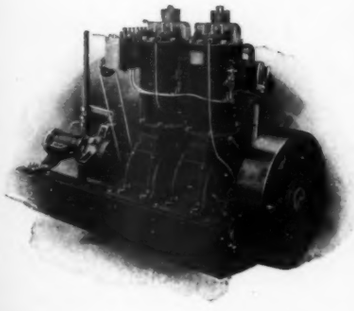
NO VALVES GEARS ELECTRICITY CARBURETOR **IT IS** RELIABLE ECONOMICAL SIMPLE ACCESSIBLE

NOT a gasoline engine with oil attachment. You have heard some people knock the "Oil Engine?" Write us about it, all "Oil Engines" are not alike. As an instance, we have sold one consumer (not a dealer) over $12,000.00 worth of engines on repeat orders.







These engines are built for *business* not for *play*. They go into plants and boats that *must go*.

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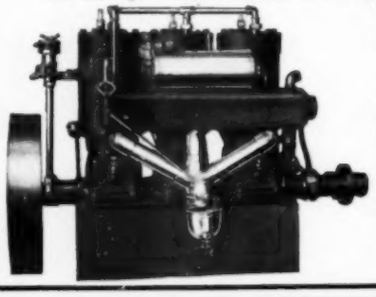
"THE MOTOR THAT MOTES"

2½ to 28 H.P. Medium and Semi-Speed Models

The most practical, economical and durable motor on the market at the present time.



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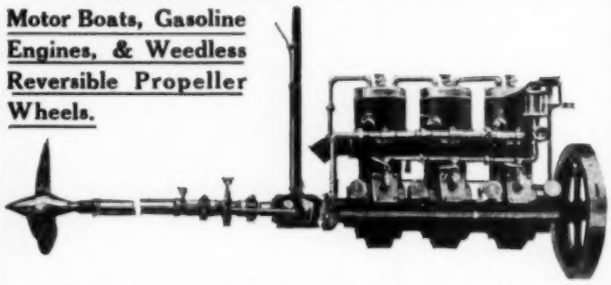
Champaign Bros., Ithaca, N.Y.

Motor Boats, Gasoline Engines, & Weedless Reversible Propeller Wheels.



12 H. P., 3-Cylinder Engine, with Weedless Reversible Propeller, Shafting, etc., $245.00. Engine without Propeller, $200.00. Engines guaranteed forever.

This is one of THE HYDE METAL BOATS

Sensation of the Season.

A 5 Piece, Knocked Down, Sheet Metal Boat.

Formed by our new process, completely set up in shop, every part accurately fitted. Guaranteed to assemble quickly and easily. Large variety of sizes.

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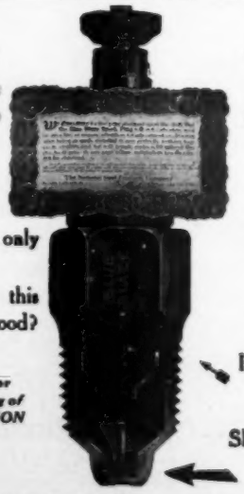
Guaranteed not to be taken from your cylinder for the entire year

Others may be easy to clean



You don't have to clean this one

Mica only **$1.50**

Don't this look good?

See the Inner Shell

See the Sharp Nose

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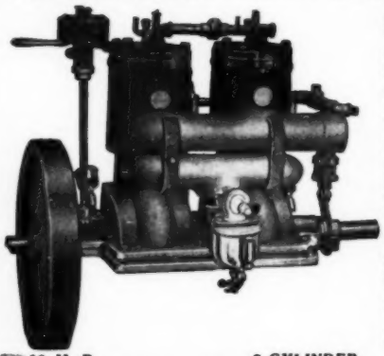
The National Steel Products Co.,

225 to 227 Broadway Lorain, Ohio

Your Interest Demands an Investigation of The Wonder Marine Gasoline Engines



Smoothest running and most powerful engines for their weight that have ever turned a propeller. This is one of our latest engines and is ahead of anything else on the market. Complete with Schebler carburettor, Crouse-Hinds timer and silent muffler. Runs equally well in either direction. Is built to run and does it.

Superfluous weight is eliminated by careful designing, resulting in a steady, powerful machine. Will drive an ordinary 20 to 21-foot boat 12 to 16 miles an hour. Equipped with a plunger pump, which can be run in either direction without clogging.

We make engines from 1½ H. P. to 75 H. P., and they are all constructed in the same careful, thorough manner. There are 3,000 Wonder Marine Gasoline Engines throughout the United States. We say frankly you ought to investigate the Wonder Engines before deciding. Write for catalogue giving all details and price list. Prompt Shipments.

10 H. P. $200 COMPLETE **2 CYLINDER WEIGHT 200 LBS.**

Attractive proposition for live representatives.

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New York Agents, Universal Automobile & Motor Boat Supply Co., 12 Chambers St.

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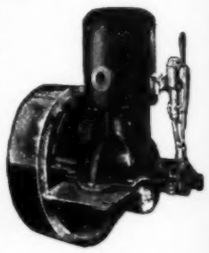
MARINE ENGINES

The simplest, staunchest, swiftest, most powerful and efficient 2-cycle engine of its size built. Perfect and refined in every detail. Makes speedy launch out of ordinary canoe, row boat, skiff, yacht tender. Great for hunting, fishing and flat-bottom boats, and 14 to 20 feet speed launches.



2 Actual H. P. Bare Engine $23

Complete Engine with Accessories and Fresh Water Boat Fittings, $42.00. Salt Water Boat Fittings, $4.00 extra.

Anyone can install and run. Compact, strong, durable, reliable, reversible, economical, safe. We also make up to 10 H. P., one and two cylinders. Sold direct from factory to user. Fully guaranteed. 30 days approval. Prompt shipment. Order now.

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Send today for this free book, and study up on the question of how to fit up your motor boat for next season with a complete electric lighting outfit at small expense. The most complete book of the kind ever printed. If you had trouble with oil lamps last season, you surely should read this book. Sit down and write for it today.

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FOR THE GALLEY, PANTRY, SIDEBOARD, OR FOR THE MOTOR

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"SPEEDWAY"

means marine gasoline engine efficiency. A strictly high-class up-to-date all around motor for cruising, speed or commercial boats, four cycle type, 8 to 150 H. P. in stock. Hundreds of them in successful operation in all parts of the world.

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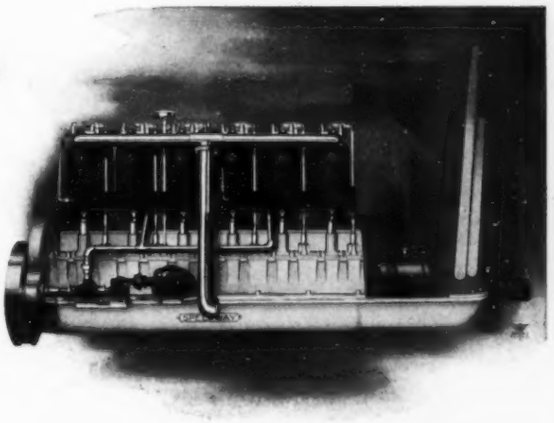
Designers and Constructors of High Class Craft of All Sizes and Styles for Pleasure or Commercial Service.



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Prest-O-Carbon Remover

More Power, More Speed and More Smoothness

AN Engine clogged up with carbon deposits loses compression and power; "pounds," overheats, and gets noisy. Prest-O-Carbon Remover, injected into the cylinders, loosens and removes all carbon from pistons, piston rings, cylinder walls and valves. Clean out your engine with it, and then use it about once a month.

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Can also be used effectively in removing lime and other deposits from water jackets and pipes. Makes foul spark plugs good as new. Clean and simple to use. Doesn't affect the metal in any way.

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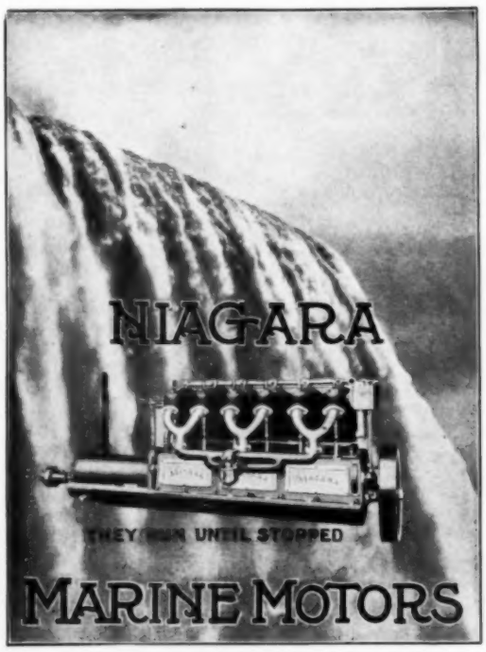

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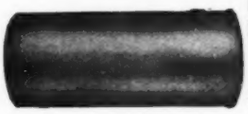

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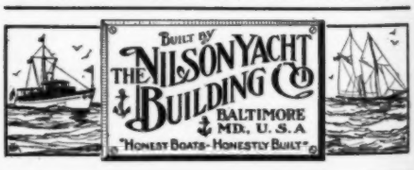

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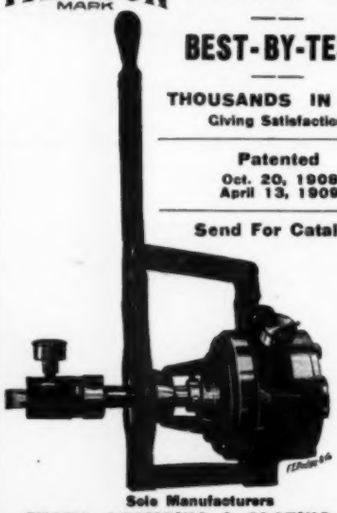

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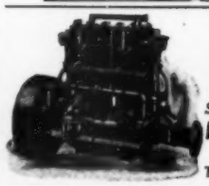

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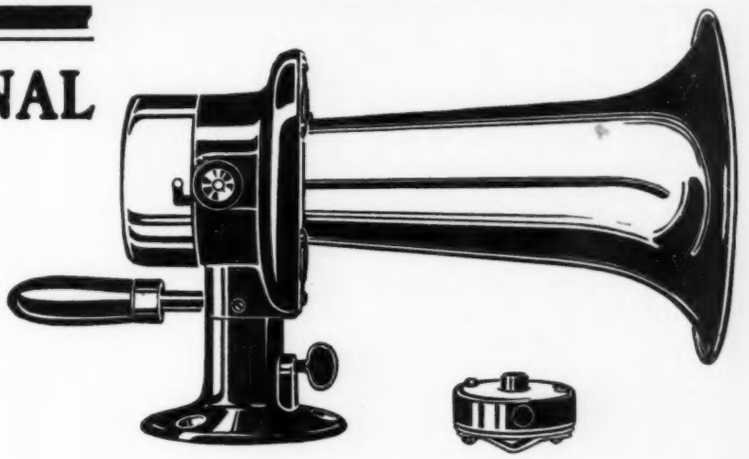

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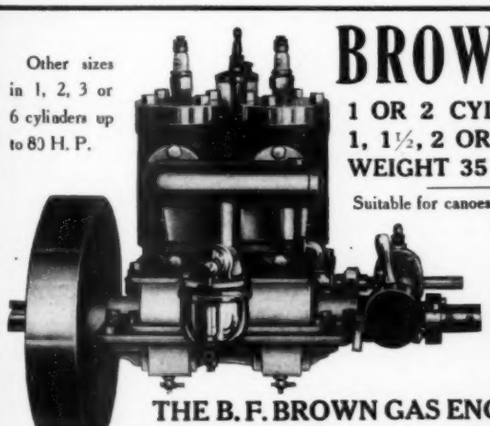

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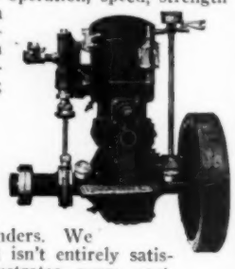

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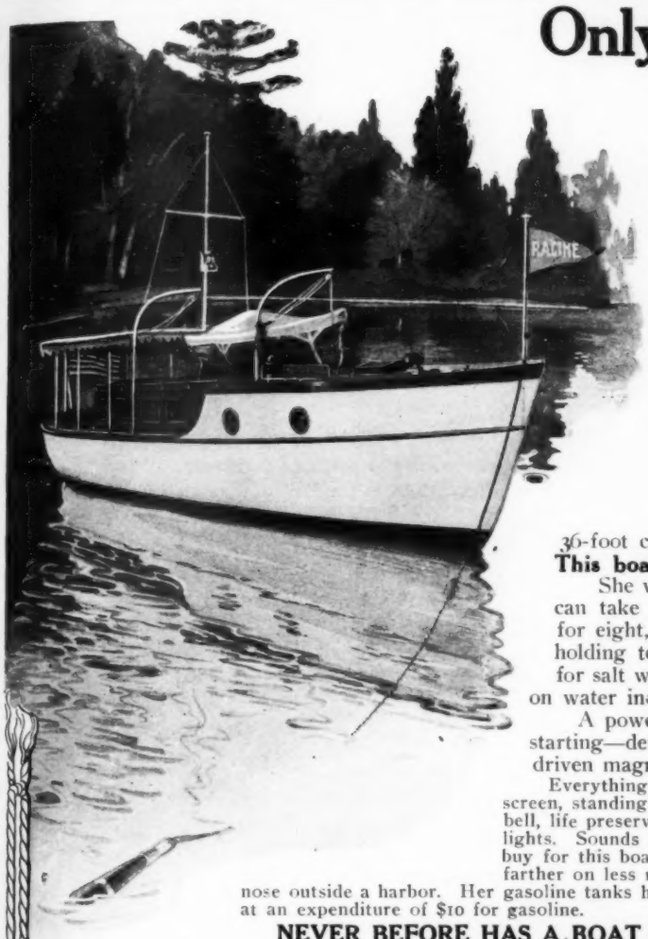

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36-foot combination raised-deck and trunk cabin off-shore cruiser. **This boat was the biggest sensation of the season's boat shows.**

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Every detail of hull and fittings is up to the regular Racine standard, nothing scrimped, no pains of labor or material spared just to make the price low. The usual Racine guarantee covers the boat.

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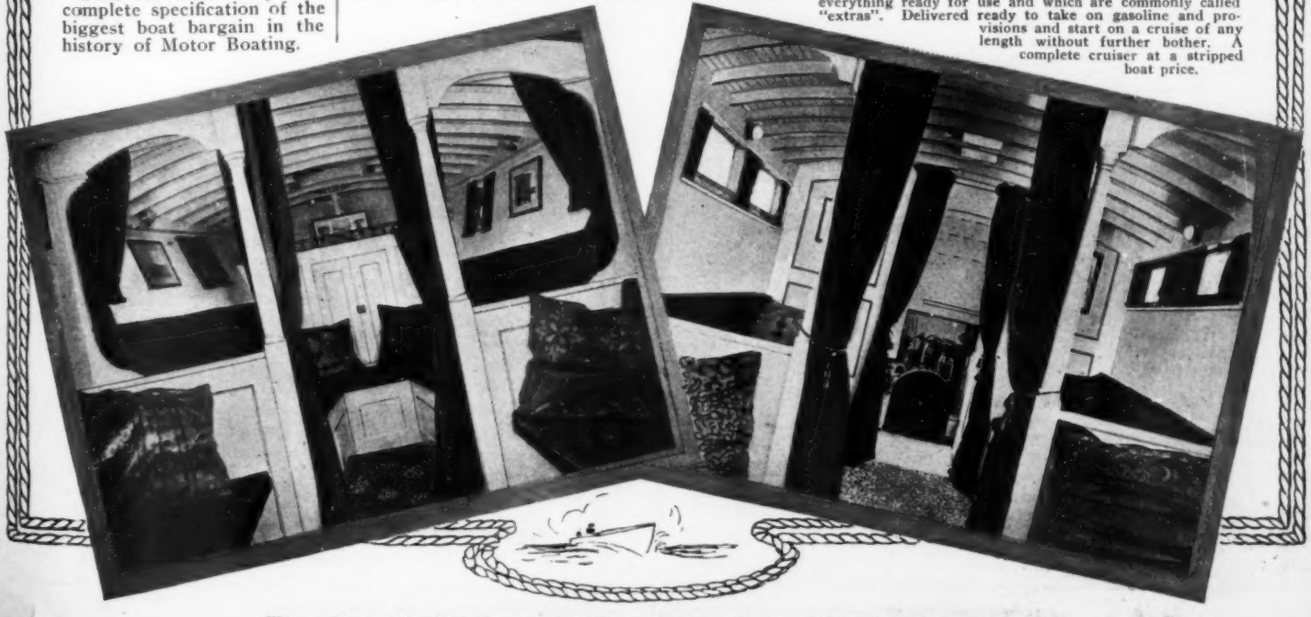

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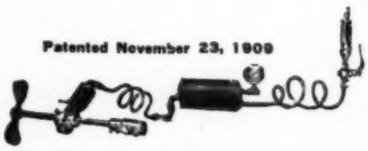

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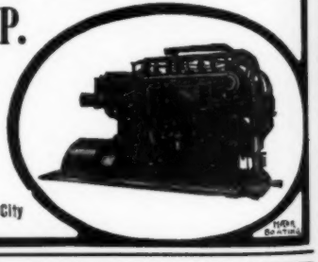

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Instantly—no matter whether it is gasoline, oil, or the most inflammable thing known.

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It will even put out an electric arc.

You should have one in your boat or auto—hundreds of other owners have. It is approved and used by the New York Fire Department and in the United States government service.

Pyrene is a chemical fire extinguisher that will not freeze, never loses its strength, will not injure anything it is thrown on, requires no attention or recharging until entirely used, instantly **smothers** any kind of fire, and is absolutely a non-conductor of electricity.

Pyrene Manufacturing Co.

34 West 33d Street, New York City

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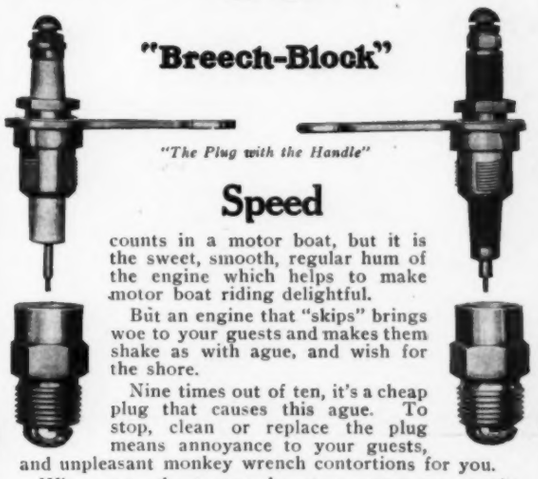

"The Plug with the Handle"

Speed

counts in a motor boat, but it is the sweet, smooth, regular hum of the engine which helps to make motor boat riding delightful.

But an engine that "skips" brings woe to your guests and makes them shake as with ague, and wish for the shore.

Nine times out of ten, it's a cheap plug that causes this ague. To stop, clean or replace the plug means annoyance to your guests, and unpleasant monkey wrench contortions for you.

Wise motor boat men, however, never get caught. They use only **"Breech Blocks"** which have chambered ends to keep out the soot and oil.

None but the brain-sick can fail to appreciate what it means to be able to pick out your spark plug without tools as you would pick out your watch—with the whole insulator exposed for easy cleaning—to clean it with a single twist—drop it back in place, locked tight, in less than six seconds.

You can put in a new plug with the same ease—without stopping the engine, if you carry an extra one with you.

All threads; Mica $1.75, Porcelain $1.50. At dealers, or postpaid. Send for booklet.

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1 to 1 1-2 H. P.

A 1910 SENSATION

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Equipped with Lubricator, Grease Cups, Brass Pump, Muffler, Generator, Reversing Lever, Couplings, Stuffing Box, 3 blade Propeller, 4 feet Steel Shafting, Batteries, Spark Coil, Spark Plug and Lag Screws.

The greatest little marine engine in the world at a small cost.

Cheap but powerful, efficient and reliable, never stops unless YOU stop it. Can be operated by a child.

Will drive a small boat 8 miles per hour. Output limited.

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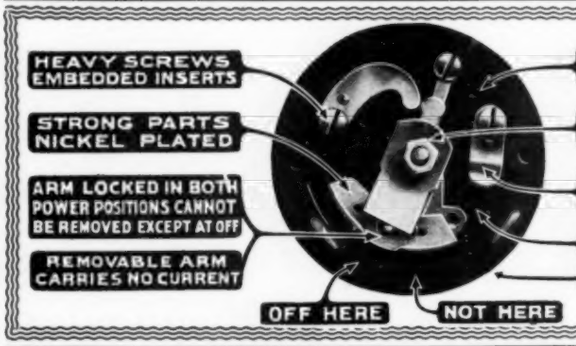

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It is about three hours work for two men to uncrate and re-erect it, and it is then ready to plank. We furnish full size patterns for every piece of plank. Anyone, experience unnecessary, can finish this boat. It of course requires more time, but is really a simpler task than building a row boat. You can build a 35 ft. or 40 ft. cruiser for less money than you would ordinarily pay for a 20 ft. open launch, if bought at any factory in the land.

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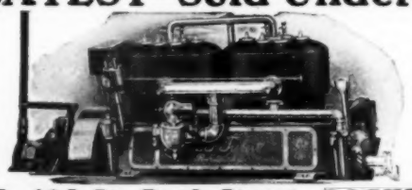

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You cannot possibly get the full power of your motor converted into speed unless the propeller used for your boat is just the right one as to size, pitch and width of blades. **The Gordon Reversible and Interchangeable Blade Propeller** is of such design and construction as to enable you to get exactly the right propeller wheels.

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The Gordon is the only *reversible* propeller with which this is possible.

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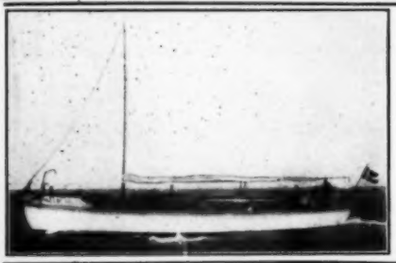

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Fuels—Kerosene, Gasolene, Alcohol, Distillate.

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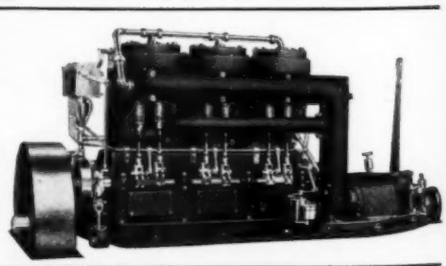

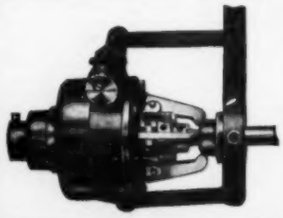

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1910 Models now ready

INSIDE FACTS: Multiple disc friction that won't slip. Three slow running steel spur gears that will neither grumble nor break.

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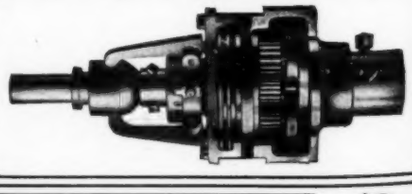

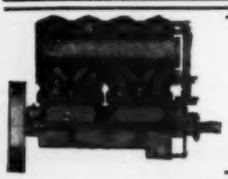

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Two Cycle, Open Crank Case.

Dodge Engine Co. **384 Atlantic Ave., Boston, Mass.**

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Arco Spotzoff is the quickest, cleanest, easiest, snappiest metal polish on earth. We like to send samples—especially to motorboat owners. Your name on a postcard brings one.

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We are looking for live merchants and garage owners and ship chandlers everywhere—and we have a very special proposition to offer the early ones. Be early

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YOU WANT A BOAT

Build It Yourself and Save Two-Thirds

We will furnish you with all the parts of a boat machined, cut to shape, and accurately fitted together prior to shipment, so that with a little labor on your part, you can own your own boat, at a price that is ridiculously low, or we will furnish you with instructions and full size paper patterns, from which you can build the boat yourself, by purchasing the material locally.

You want to know how it can be done? Then send to-day—not to-morrow—for

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Do you know that local boat-builders all over the country purchase our frames—build the boats and sell them at a handsome profit? You can do this yourself and save that profit. Anyone can put our Knock-Down boats together—no skill is required. The work is a clean, instructive form of recreation—a mighty good thing for you or your boy.

We save you (1) the boat-builder's profit; (2) labor expense; (3) big selling expense; (4) seven-eighths the freight.

Don't fail to send for Catalog No. 24—it tells the whole story

OUR GUARANTEE

is that you will be perfectly satisfied with everything you purchase of us. or your money will be instantly refunded.

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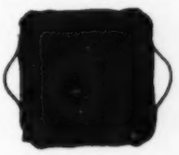
Originators of the Pattern and Knock-Down System of Boat-Building.

Established 1901

Kenyon Life Preserver Pillows and Cushions Have a Greater Sustaining Power Than Standard Life Preservers.

NOT only are the Kenyon Life Preserver Cushions and Pillows the best, the most durable, and most completely waterproof cushions made, but they will, also, in case of emergency, sustain a heavier body in the water for a longer time than the regular standard life preserver.

They contain no cork, but *do* contain a *non-absorbent* filling which makes them as soft as if filled with down.



Kenyon Life Preserver Pillow

Kenyon Life Preserver Cushion

They are made in the popular mission shape, covered with either leather or imitation leather, in tan, green or red.

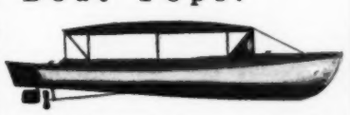
They will support the heaviest person in the water for an indefinite period of time, and are far more buoyant than any regular life preserver made.

These famous Kenyon Life Preserver Cushions and Pillows are made in one stock size or in any size to order.

Send for illustrated descriptive price catalogue today---NOW.

Kenyon Boat Tops.

are folding tops for motor boats. They can be raised and lowered at will quickly and without inconvenience or damage to the material. They are so simple in construction that a glance at a Kenyon Auto Top instantly shows you how to handle it. They are light, strong, handsome and convenient.



Write for catalogue which describes and illustrates the Kenyon Tops in detail.

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THE "KENNEBEC"

Sturdy Enough for the Fisherman

The fisherman, who goes out in any and all kinds of weather, day and night,—winter and summer,—puts his engine to the severest test possible.

His very livelihood depends upon the reliability of his motor, and he MUST have an engine upon which he can depend at all times and seasons, and under all conditions.

Do you want a better recommendation than this for the engine for your Motor Boat?

Handsome Enough for the Finest Pleasure Boat

Remember, Mr. Boat-Owner, that while you do want an engine upon which you can depend, and which will stand up under all possible hard knocks, you do not want a rough looking, uncouth mass of metal to put in that handsome new boat of yours, and just because the KENNEBEC stands hard usage and exacting conditions, do not fancy it is a "rough jewel." It runs more smoothly and is the most completely equipped motor that you have ever seen, splendidly finished and in any size exceeds its rated horse-power from thirty to forty per cent.

Ask the Fishermen what they think of the "KENNEBEC" ENGINE

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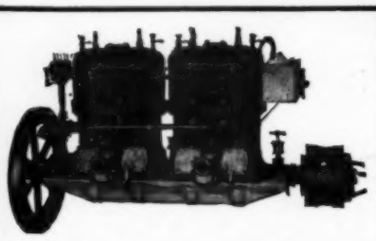

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Atwater-Kent Ignition, Mechanical Force-Feed Oiler, Aluminum Composition Bed and Hand-hole Plates,

Water-Cooled Exhaust and Salt Water Fittings

16-20 H. P. TWO CYLINDER TWO CYCLE, 337 LBS. $250

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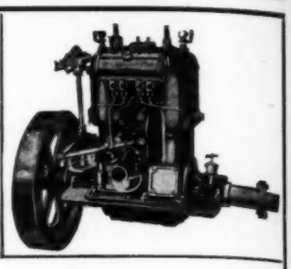

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Vanadium and Krupp Steel Working Parts. Copper Water Jacket

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Embody the most improved design and the highest quality in Marine Motors known to the Motor Boat world.

ERD MOTORS have won their great reputation through the perfect service they have given in the hands of inexperienced operators.

Let us figure with you on the power equipment for your boat. We can save you money. Write today for our illustrated catalog No. 47.

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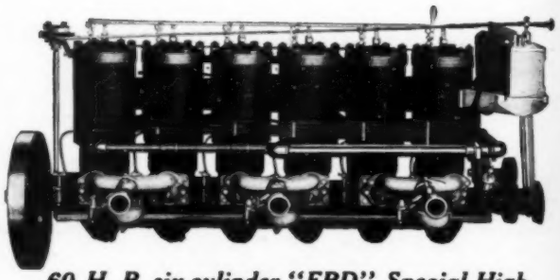
SAGINAW, MICH. U. S. A.



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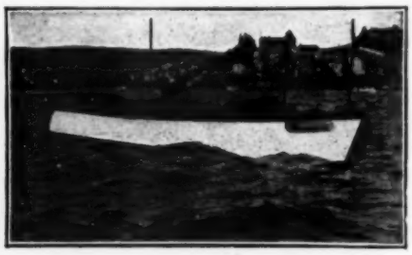
THIS BOAT WAS BUILT BY AN AMATEUR WITH FAULTLESS ERECTED FRAMES



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THE VALLEY BOAT & ENGINE CO.

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Will Hereafter be Located at

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IN AN EXTENSIVE NEW PLANT WITH INCREASED FACILITIES

for the rapid and efficient handling of all classes of Marine Work.

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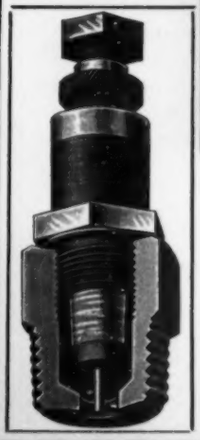

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THE FOLLOWING JOBBERS HANDLE COMET and SOOTLESS SPARK PLUGS

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COMPLETE ELECTRIC LIGHT OUTFITS

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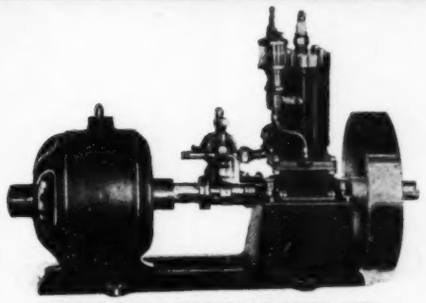


NEW 2 CYCLE DIRECT-CONNECTED SETS

These are compact, light-weight and built in small sizes, 1, 2 and 3 H. P., for small cruisers. They are built like a watch; jump spark ignition and are complete in every detail. Ask for Prices.

If you have a Camp you would like to Light, ask for our Booklet on New Low Voltage Residence Outfits

OF INTEREST TO THE OCEAN RACE PEOPLE AND CRUISERS

The Matthews Boat Co.,
Port Clinton, Ohio.
Oct. 31, '07.

Richardson Engineering Co.,
Hartford, Conn.

Gentlemen:—Your favor of the 28th inst. has been received making inquiry regarding the service received from the electric installation in my yacht "Onward".

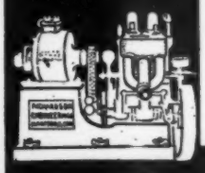
Will state in this regard, that it has given excellent satisfaction in every way. We used the outfit from the time we left Peoria, Ill., until our return the following year to Cleveland, on an extended cruise of over 9,000 miles, and during that period of time, we had the best of light, and no trouble worth speaking of. The only trouble we might mention, was with the belt and pulley on generator. This, however, was repaired, and thereafter no further trouble occurred.

Yours respectfully,
Signed S. J. MATTHEWS.

SJM—ESH

The Richardson Engineering Co., Hartford, Conn.

MARINE ELECTRIC LIGHT OUTFITS $150 UP
STATIONARY ELECTRIC LIGHT OUTFITS $262 UP



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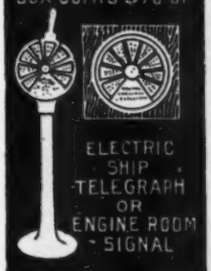

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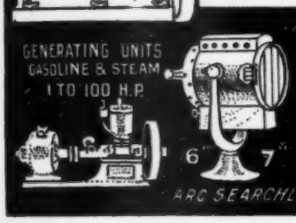

GENERATING UNITS GASOLINE & STEAM 1 TO 100 H.P.

6" 7" ARC SEARCHLIGHT

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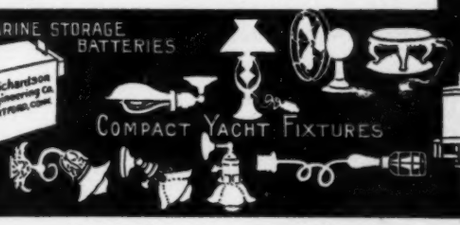
SPECIAL MARINE STORAGE BATTERIES

COMPACT YACHT FIXTURES

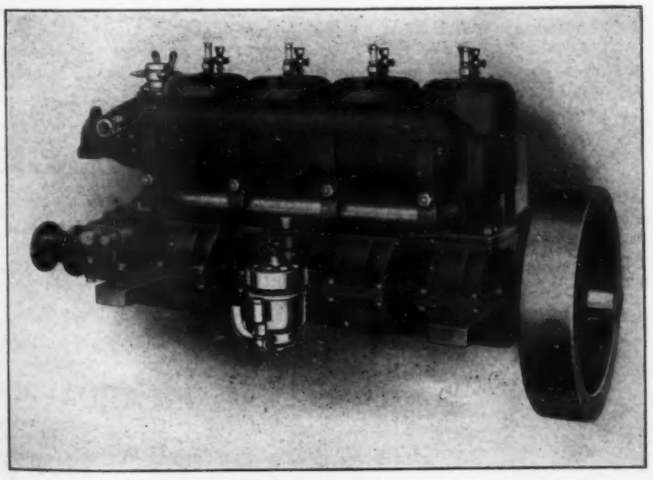


AUTOMATIC STORAGE BATTERY CHARGING SWITCHES

Roberts Motors Win Again

After the most thorough tests by expert mechanical engineers, the W. H. Mullins Co. (The World's Largest Boat Builders), recently placed an order for 2,000 specially designed Roberts Motors. This is the largest order ever placed for marine engines and is convincing evidence of the superiority of Roberts Motors.

ROBERTS 1910 MODELS ARE THE PERFECTION OF SIMPLICITY



The large ports, which have proved such a success on 1909 Model P will be used on all 1910 models—the new noiseless carbureter, with but one adjustment (the gasoline) is a great improvement. Gear-driven mechanical oilers will be supplied with all motors from 10 H. P. up, also gear pump—readily accessible and easy to remove for packing or cleaning without disturbing the piping.

The Roberts is the only two-cycle engine made that is absolutely guaranteed against backfiring or base explosions. It is the lightest and most efficient engine built. Every part is so accurately adjusted that it starts on the first turn of the crank, and will not stall at any speed. The Roberts gives greater power and more speed than any other motor of the same H. P. made.

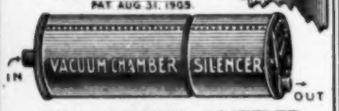
WRITE TO-DAY FOR BOOK OF TESTIMONIALS AND CATALOG which fully describes our 11 unequalled models, from 1½ to 60 H. P. and their many new improvements.

THE ROBERTS MOTOR COMPANY

1501 Columbus Ave., SANDUSKY, O., U. S. A.

"THE YANKEE" SILENT MUFFLER AND POWER WHISTLE OUTFITS

YANKEE MUFFLER
PAT. AUG. 31, 1909.



THE YANKEE MUFFLER

Constructed of sheet steel, riveted seams, asbestos lined and galvanized. Water cooled for boats. Will operate successfully on 2 or 4-cycle gasoline engine. NO BACK PRESSURE. ABSOLUTELY SILENT. Sizes: ½ to 150 H.P. Satisfaction guaranteed. Over 200,000 in use.

The YANKEE CO., Box "MB," Utica, N.Y.

Both for sale in New York by Durkee & Co., 2 South St.; E. J. Willis Co., 8 Park Place; Chas. E. Miller, 97 Reade St.; P. G. Chapman & Co., 99 West St. Philadelphia: W. F. Carmen, Bourse Bldg. Chicago: Bullock-Waite Co., 86 E. Lake St. San Francisco: California Gas Engine & Supply Co. Canada: Canadian-Fairbanks, Montreal and Toronto.

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Complete as shown in cut Nos. 4, 5, 6, 7—$20.00 to $30.00

The Yankee Whistle Outfit may be attached to any gasoline engine of any make or description in a few minutes.

It takes no power from the engine.

It has the only automatic CHECK valve that does not operate on compression. AN EXPLOSION MUST TAKE PLACE IN THE CYLINDER OR VALVE REMAINS CLOSED.

Absolutely safe. No live gases can enter tank.

Easily adjusted and requires no further attention.

Polished four-tone chime whistle, galvanized air tank—equalizes engine pressure—valve closes automatically. Also provided with safety valve.

Fills every requirement of the law. Satisfaction guaranteed.

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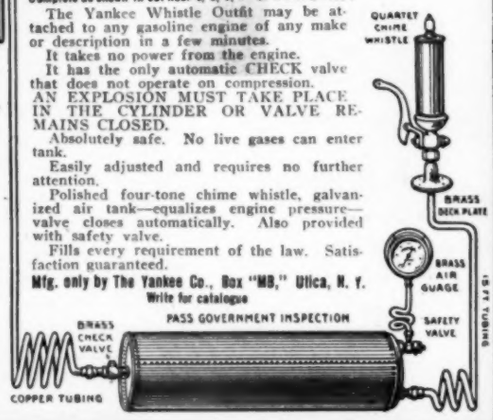

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Sizes 2½ H. P. to 40 H. P. Two and Four-Cycle.

Do justice to yourself, your boat, and us by investigating these famous gasolene motors.

We build boats. Send for catalogue describing the Famous Knox Dory Launch.

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If a power cruising yacht, we offer seventeen years of successful experience to back up our proposition to you. On request, we submit preliminary plans of your requirements, or estimate on any naval architect's designs. We protect you against loss or disappointment in motor or hull. If a runabout, we offer the best value, regardless of cost, on the American market.

36-ft., 17-H.P., 3-cylinder, 2-cycle motor, speed 13½ miles.

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No more back breaking work at the pump, runs by friction from the fly wheel of the engine.

Made of solid bronze, guaranteed for a year and will last a lifetime.

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A high speed, perfectly safe boat of a wonderful model. All the luxury of canoeing, all the charm of motoring at high speed, with all the safety of a cruiser—stiff—steady—safe—graceful in design—dry. Comfortable arrangement—and the strongest motor canoe made. Fully guaranteed. Twenty feet long—made of cedar—copper fastened—equipped with the simplest, most reliable, smoothest running, highest grade 2 H. P. engine made. Send today for Power Canoe Bulletin No. 81. (44)

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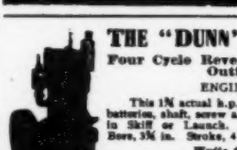

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Four Cycle Reversible Outfit Complete $42.50

ENGINE ONLY, $33

This 1¾ actual h.p. Four Cycle Motor, with best oil, batteries, shaft, screw and muffler, tested, ready to install in Skiff or Launch. Weight of motor, 80 pounds. Bore, 3¾ in. Stroke, 4 in.

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On Rough Water or Smooth, You Can Pin Your Trust Every Time IN A LOEW-VICTOR ENGINE

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You know that in this day and age of the sport of motor boating, the *power plant* of boats you send out backed with your name and reputation is no less important, in the eyes of even the novice, than the perfectly drawn lines and luxury and convenience of equipment of the hull.

You will gain both in name and in pocket-book in equipping *your* product with Loew-Victor Engines. *Your* boats will gain *quickly* even an added reputation for every-day-in-week reliability, that will make your sales manager smile.

Many of the leading boat builders, both East and West, are now making the Loew-Victor their regular installation. Many who have their own foundries and shops are finding it cheaper and more satisfactory to install the Loew-Victor. Let us tell *you* in detail what other builders have found.

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You—Mr. Motor Boat Crank—you who have hung on by your teeth in the trough of a rising sea, while striving to make go the motor which wouldn't "moat," who have had to make your sailing dates depend upon the fickleness of the power plant—take out the old rattle trap this season and put in a *real* engine—a Loew-Victor. You will come to it sooner or later anyway—because you who know motor boats and motor boating know that after all the engine is the heart of the craft, and a Loew-Victor never goes back on the skipper. You can end your engine troubles once and for all—do away with the annoyance and the fuss and bother by putting a Loew-Victor in your boat before the season starts. It will be real economy. Let us tell *you* how easy it will be to make this change.

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To you, sir, we say, remember this: It is the *motor* in the boat you buy not the design or cushions in the hull, upon which you must depend to take you out surely and bring you back safely. The pleasure you will derive from the great sport of motor boating will depend almost entirely upon the reliability of your engine. Your safety and the comfort of yourself and your guests will depend upon it. With a poor engine motor boating will be to you just drudgery, with nothing but trouble and vexation.

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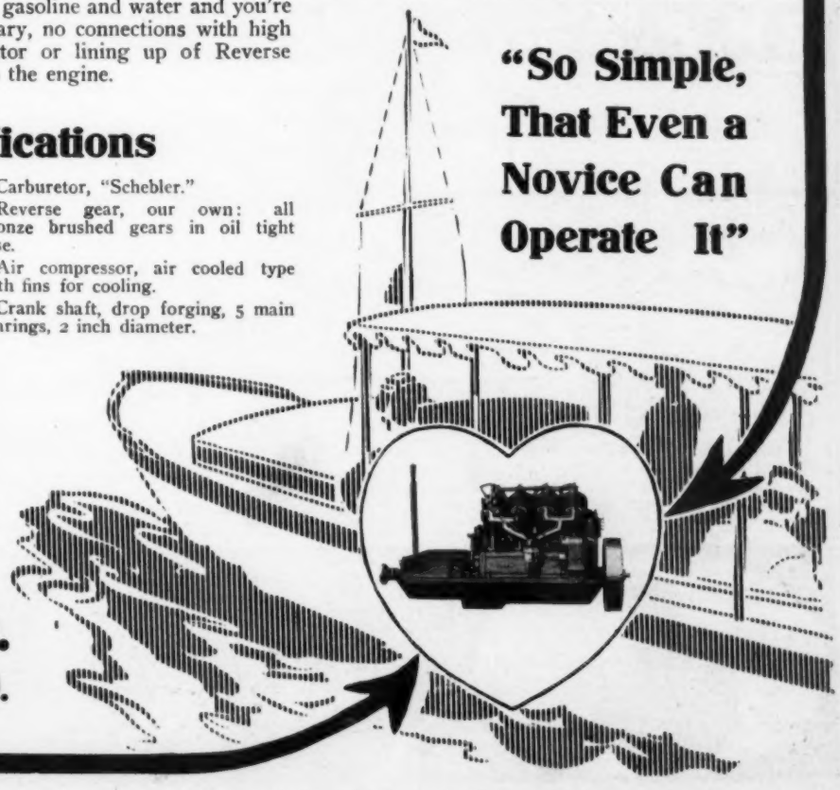
Size, 4½ x 5½.
Water Pump, Bronze of Plunger type.
Bearings, all crank case and connecting rod bearings are die cast of white bronze metal.
Magneto, high tension, Splitdorf.
Oiling system. Automatic plunger pump.
Carburetor, "Schebler."
Reverse gear, our own: all bronze brushed gears in oil tight case.
Air compressor, air cooled type with fins for cooling.
Crank shaft, drop forging, 5 main bearings, 2 inch diameter.

Write today for catalogue and detailed specifications. Tell us all about the work you want your engine to do. The style and size of your boat. We invite requests for bids on quantities from boat builders.

The Loew Mfg. Co.
W. 96th Street, Cleveland, O.



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We have in stock 100 MEDIUM DUTY MARINE ENGINES, built for the firm of BREED & DE BLOIS (dissolved), formerly of 1876 Broadway, New York. The failure of BREED & DE BLOIS gives the engine buyer the CHANCE OF HIS LIFE, as we will retail these engines at CONTRACT PRICE, direct to the customer. An engine of higher quality cannot be built, and these engines carry our absolute guarantee of quality, workmanship and performance. The Harriman Motor Works will carry a complete line of parts for the engines and will continue the production of this type of engine. Power: 10 H. P. to 30 H. P.

HF High Speed marine engines built by this company will give you more speed for your hydroplane or racing boat, as they are more powerful for their weight than any engine on the market. Power: 10 H. P. to 100 H. P.

Write us for prices and particulars

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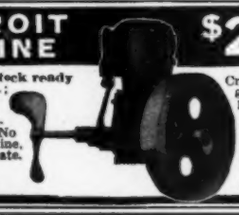

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Our Motor Boat will spend the winter in Southern waters.

WILL GIVE DEMONSTRATIONS. WRITE US.

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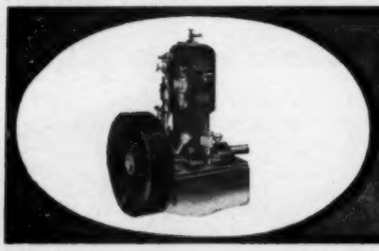

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The Hartford two-cycle marine engines are made in five sizes, ranging from three to ten horsepower, in one and two-cylinder models.
They are thoroughly guaranteed in every way.

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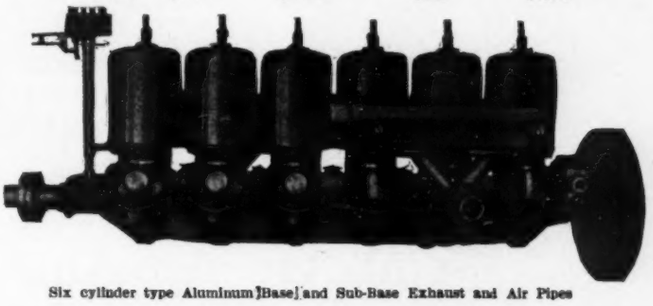
"MASCOT"
Owned by E. Corsepius, Fort Madison, Iowa, equipped with 6 Cylinder Pierce-Budd Co. engine—speed much over 30 miles per hour.

These are some of the owners—E. Corsepius, Fort Madison, Iowa, Fred B. Smith, Terre Haute, Ind.; Capt. Wm. Rattray, Marine City, Mich.; A. Arnold, Jr., Bay City, Mich.; Minn. Boat and Power Co., Stillwater, Minn.; Dr. O. B. Monosmith, Lorain, O.; S. P. Pankost, Sacramento, Cal., and many others.

The following boats all over 30 miles per hour are equipped with our 6 cylinder Engines; "Mascot," "Coyote," "102," "Teddy II," "Evangeline," and another just finished before close of navigation which made 33 miles per hour.

1910 TYPES

	4 to 6 H. P	12 to 15 H. P	18 to 25 H. P.	40 to 60 H. P.
	1	2	3	6 Cylinders
Weights	116 lbs	170 lbs	217 lbs	390 lbs
Price	$155	$295	$450	$1072



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Strong—Simple—Durable. Made from best material attainable—by motor experts.

Best equipped Engine in the world. Send for new 1910 catalog.

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Loveland Marine Motors are Guaranteed for 5 Years

That's a long time, but it's a guarantee that we've never been asked to make good on.

Single cylinder; two cycle; reversible; sparking system absolutely waterproof; no valves; no gears; no automatic sparker or springs; no anything that is troublesome or unreliable.

The Loveland single cylinder, two cycle motors are made in 2, 4½ and 7 h. p., and while they are high quality all through they are low priced.

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Let us quote you on your requirements.

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Necessary on every motor-boat a device by which a Jump-Spark Engine is easily made Speedily and Absolutely Immune to the effect of water or moisture in any form.

Of what actual use is a high-grade engine in the finest hull when it "lays down" in the fog, rain, or bad sea at the time you need it most, merely because its secondary (high tension) wires are wet or have absorbed moisture.

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"Perfex" Ignition is Safe because it has no secondary wires and is waterproof. High tension voltage (estimated at 10,000 volts) is needed at one place ONLY—The Spark-Gap! Anywhere else it is a nuisance and eventually a positive breeder of engine trouble. "Perfex" Ignition gives more power because its spark has a UNIQUE QUALITY and is CONCENTRATED AT the spark-gap. "Perfex" Ignition System is wired low-tension, but has a high-tension ignitor (the combined induction coil and plug).

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Renewable "Reliance" Porcelain

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Removable Spark Plug

Perfex Master Vibrator

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Send for 12-page booklet and low prices. All dealers will furnish Perfex Ignition.

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"BUFFALO"

There are twenty-two BUFFALOS—from 2 to 225 H. P., and from 1 to 8 cylinders—in Regular, Heavy Duty and High-Speed Types

"The Engine of Constant Service"

IN EVERY LAND AND ON ALL WATERS, BUFFALOS made good—because we made them best. We put lots of money into their making, to make them make lots of money for us.

It's just our business policy—started a dozen years ago—to make better profits by making best engines. It's been good for us and good for you.

We frankly admit we didn't establish this policy of making BUFFALOS better than the rest, for your benefit. It was merely a dollar-getting business plan on our part.

As a secondary consideration it benefited the buyer. Under this plan of building them up to the highest possible standard, BUFFALOS everywhere have proven their worth—in result-showing service—thus speaking eloquently for themselves, which is better than having the uncorroborated advertising man speak for them.

We certainly would be foolish to give up our profitable policy of making BUFFALOS just the best that is possible. No business man abandons a money-making method. Wherefore we repeat our creed:

Constant refinement of design, of course.

Improved construction, always. But no better materials, or equipment, until science discovers them.

BUFFALO GASOLENE MOTOR CO.

1204-16 Niagara St., BUFFALO, N. Y.

CATALOG? ASK FOR IT

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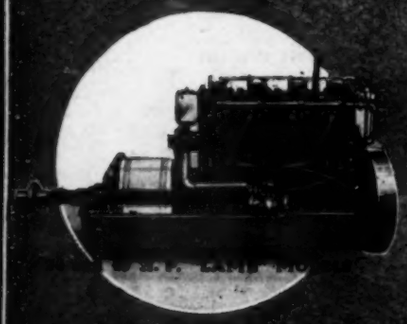
"It always goes and keeps going until I stop it."

Size
4 Cycle Engines

MEDIUM DUTY
3 Cylinder, 15 H. P.
4 Cylinder, 18 H. P.
4 Cylinder, 24 H. P.
6 Cylinder, 40 H. P.

HEAVY DUTY
4 Cylinder, 30 H. P.
4 Cylinder, 40 H. P.
6 Cylinder, 60 H. P.

Special Racing Engines to order only in 4, 6, 8 and 12 Cylinders



LAMB IV. 1909 CHAMPION M. V. P. B. A.

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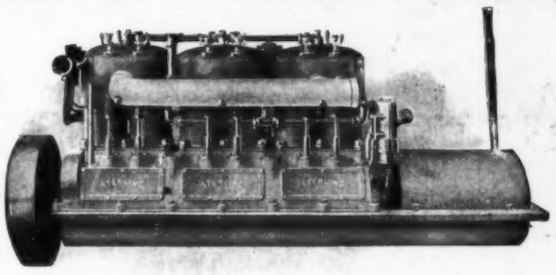

45-65 H. P.

The "Courier II" March 13 made the fastest time ever made by a motor boat at Palm Beach, Florida. The "Courier II" finished first in the speed record trial, which means six one mile races. She was, however, disqualified for making greater speed in a later race. Powered with a 240 H. P. Sterling racing engine, the "Courier II" was unofficially timed, doing 35.73 miles per hour.

STERLINGS WON AT PALM BEACH 1909

DEWEY—THE WINNER

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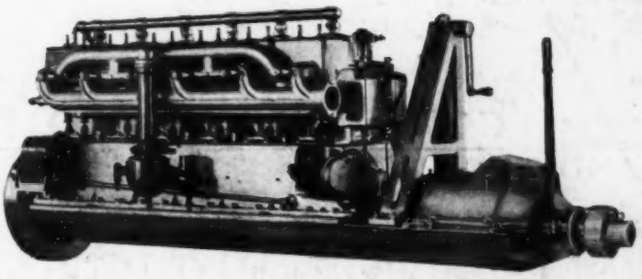

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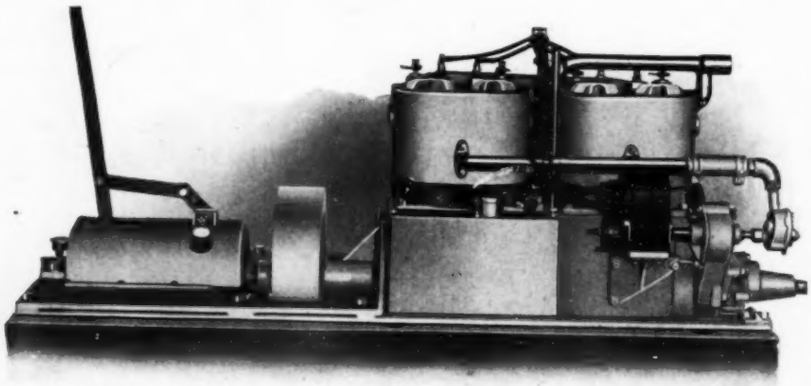

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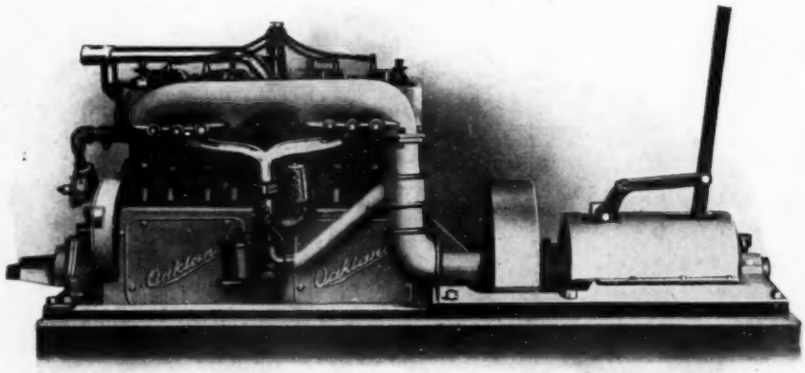

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